



# STIC Search Report

## EIC 2600

STIC Database Tracking Number: 108302

TO: Leland Jorgensen  
Location: CPK2-6V3  
Art Unit : 2675  
Wednesday, November 19, 2003

Case Serial Number: 09/874,128

From: Vamshi Kalakuntla  
Location: EIC 2600  
PK2-3C03  
Phone: 306-0254

Vamshi.kalakuntla@uspto.gov

### Search Notes

Dear Leland Jorgensen;

Attached please find the results of your search request 09/874,128.

I used the search strategy based on the search request and our conversation. I emailed to you to edit, not hearing from you I proceeded.

I searched the standard Dialog files, IBM TDBs, DTIC STINET, IEEE, and the internet.

If you would like a re-focus please let me know.

Please feel free to contact me if you have questions or concerns. Thank you and have a great day.

*Please take a moment and fill out the attached feedback form. Thank you.*

Vamshi

File 2:INSPEC 1969-2003/Nov W2  
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File 6:NTIS 1964-2003/Nov W3  
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File 8:Ei Compendex(R) 1970-2003/Nov W2  
(c) 2003 Elsevier Eng. Info. Inc.  
File 34:SciSearch(R) Cited Ref Sci 1990-2003/Nov W2  
(c) 2003 Inst for Sci Info  
File 35:Dissertation Abs Online 1861-2003/Oct  
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File 62:SPIN(R) 1975-2003/Oct W1  
(c) 2003 American Institute of Physics  
File 65:Inside Conferences 1993-2003/Nov W3  
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File 94:JICST-EPlus 1985-2003/Nov W3  
(c)2003 Japan Science and Tech Corp(JST)  
File 95:TEME-Technology & Management 1989-2003/Nov W1  
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File 99:Wilson Appl. Sci & Tech Abs 1983-2003/Oct  
(c) 2003 The HW Wilson Co.  
File 144:Pascal 1973-2003/Nov W2  
(c) 2003 INIST/CNRS  
File 233:Internet & Personal Comp. Abs. 1981-2003/Jul  
(c) 2003, EBSCO Pub.  
File 239:Mathsci 1940-2003/Dec  
(c) 2003 American Mathematical Society  
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec  
(c) 1998 Inst for Sci Info  
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13  
(c) 2002 The Gale Group  
File 603:Newspaper Abstracts 1984-1988  
(c)2001 ProQuest Info&Learning  
File 483:Newspaper Abs Daily 1986-2003/Nov 17  
(c) 2003 ProQuest Info&Learning  
File 248:PIRA 1975-2003/Nov W2  
(c) 2003 Pira International  
File 103:Energy SciTec 1974-2003/Nov B1  
(c) 2003 Contains copyrighted material  
? ds

Set	Items	Description
S1	14208	OLED OR ORGANIC(W) (LED OR LIGHT()EMIT?() (DEVICE? ? OR DIOD- E? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL)
S2	661681	WHITE
S3	15480750	BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LOWER OR MORE OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING) (3N- ) (POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?)
S4	1975056	(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RGB)
S5	236	S1 AND S2 AND S3 AND S4
S6	5	S1 AND S2(5W)S3(5W)S4
S7	2	RD S6 (unique items)
S8	2	S7 NOT PY>2001
S9	33	S1 AND S2(5N)S3(5N)S4 NOT S6
S10	22	RD S9 (unique items)
S11	9	S10 NOT PY>2001
S12	10	AU=(SIWINSKI, M? OR SIWINSKI M?)
S13	9	RD S12 (unique items)
S14	3	S13 AND S1
S15	3	S14 NOT (S8 OR S11)

8/3,K/1 (Item 1 from file: 2)  
DIALOG(R)File 2:INSPEC  
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

7148223 INSPEC Abstract Number: B2002-02-4260D-033

**Title: White and blue temperature stabile and efficient OLEDs using amorphous spiro transport and spiro emitting compounds**

Author(s): Spreitzer, H.; Vestweber, H.; Stossel, P.; Becker, H.

Author Affiliation: Covion Org. Semicond. GmbH, Frankfurt, Germany

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)  
vol.4105 p.125-33

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 2001 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(2001)4105L:125:WBTS;1-E

Material Identity Number: C574-2001-114

U.S. Copyright Clearance Center Code: 0277-786X/01/\$15.00

Conference Title: Organic Light-Emitting Materials and Devices IV

Conference Sponsor: SPIE

Conference Date: 31 July-2 Aug. 2000 Conference Location: San Diego, CA, USA

Language: English

Subfile: B

Copyright 2002, IEE

**Title: White and blue temperature stabile and efficient OLEDs using amorphous spiro transport and spiro emitting compounds**

...Abstract: characteristics of various devices stored at elevated temperature (up to 130 degrees C): Blue multilayer **organic light emitting diodes** (OLEDs) containing PEDT (polyethylenedioxythiophene) or PANI (polyaniline) derivatives as the hole injection and buffer layer...

... an emitting material (EM) resulted in dramatically improved temperature stability: for the white and blue **OLED** no significant deterioration up to 130 degrees C were found. Devices consisting of non spiro...

8/3,K/2 (Item 1 from file: 95)  
DIALOG(R)File 95:TEME-Technology & Management  
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01653277 20020604871

**High efficiency white organic electroluminescent devices**

(Weisse organische Elektrolumineszenzanzeigen mit hoher Ausbeute)

Kishigami, Y; Tsubaki, K; Kondo, Y; Kido, J

Yamagata Univ., J; Matsushita Electric Works, Osaka, J

Asia Display / IDW '01, Proc. of the 21st Internat. Display Res. Conf. in Conjunction with the 8th Internat. Display Workshops, Vol. 1, Nagoya, J, Oct 16-19, 20012001

Document type: Conference paper Language: English

Record type: Abstract

**High efficiency white organic electroluminescent devices**

ABSTRACT:

In this paper, the authors present high efficiency white **organic electroluminescent** devices (OELDS) having a metal-doped electron injection layer at the interface between the cathode...

...To their knowledge, these luminous and quantum efficiencies are the highest values reported for white organic EL devices.

DESCRIPTORS: ELECTROLUMINESCENT DISPLAYS; WHITE COLOUR ; LIGHT EFFICIENCY ; LUMINANCE; QUANTUM EFFICIENCY ; ORGANIC SEMICONDUCTORS; DOPING AGENTS

11/3,K/1 (Item 1 from file: 2)  
DIALOG(R)File 2:INSPEC  
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7264527 INSPEC Abstract Number: B2002-06-7260D-012

**Title: Temperature stability and efficiency of white and blue OLEDs using amorphous spiro compounds**

Author(s): Vestweber, H.; Becker, H.; Busing, A.; Gelsen, O.; Heun, S.; Kluge, E.; Kreuder, W.; Schenk, H.; Spreitzer, H.; Stossel, P.; Treacher, K.

Author Affiliation: Covion Org. Semicond. GmbH, Frankfurt, Germany

Journal: ITG-Fachbericht Conference Title: ITG-Fachber. (Germany)

no.165 p.31-6

Publisher: VDE-Verlag,

Publication Date: 2001 Country of Publication: Germany

CODEN: ITGFEY ISSN: 0932-6022

SICI: 0932-6022(2001)165L:31:TSEW;1-3

Material Identity Number: G434-2001-007

Conference Title: 9th Triennial Conference of the ITG-Chapter 8.6 "Vacuum Electronics and Displays"

Conference Date: 2-3 May 2001 Conference Location: Garmisch-Partenkirchen, Germany

Language: English

Subfile: B

Copyright 2002, IEE

**Title: Temperature stability and efficiency of white and blue OLEDs using amorphous spiro compounds**

...Abstract: characteristics of various devices stored at elevated temperature (up to 130 degrees C). Blue multilayer organic light emitting diodes (OLEDs) containing PANI (polyaniline) derivatives as the hole injection and puffer layer, aromatic diamines like...

... an emitting material (EM) resulted in dramatically improved temperature stability: for the white and blue OLED no significant deterioration up to 130 degrees C were found. Devices consisting of non spiro...

Identifiers: blue OLED ; ...

...white OLED ; ...

...multilayer OLED ;

11/3,K/2 (Item 2 from file: 2)  
DIALOG(R)File 2:INSPEC  
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7156079 INSPEC Abstract Number: B2002-02-4260D-059

**Title: Structure and characterization of a white up-emitting OLED on silicon for microdisplays**

Author(s): Feng, T.; Ali, T.A.; Ramakrishnan, E.S.; Campos, R.; Howard, W.E.

Author Affiliation: eMagin Corp., Hopewell Junction, NY, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)

vol.4105 p.30-6

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 2001 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(2001)4105L:30:SCWE;1-Z

Material Identity Number: C574-2001-114

U.S. Copyright Clearance Center Code: 0277-786X/01/\$15.00  
Conference Title: Organic Light-Emitting Materials and Devices IV  
Conference Sponsor: SPIE  
Conference Date: 31 July-2 Aug. 2000      Conference Location: San Diego,  
CA, USA  
Language: English  
Subfile: B  
Copyright 2002, IEE

**Title: Structure and characterization of a white up-emitting OLED on silicon for microdisplays**

**Abstract:** We have developed highly **efficient**, top-emitting **white OLED** structures suitable for black-and- **white** or full **color** microdisplay applications. White light emission was obtained from both singly doped and doubly doped emitter...

... that of the single dopant structure incorporating only the red dopant. For top-emitting, white **OLED** devices with the double-dopant structure, we have achieved luminous efficiencies of 974 cd/m...

... sup 2/ for more than 3000 hrs. Based on an up-emitting, double-dopant white **OLED** structure, we have developed an SXGA-resolution, black-and-white active matrix **OLED** (AMOLED) on silicon microdisplay. This AMOLED-on-Si has demonstrated real-time video with 256...

Identifiers: white up-emitting **OLED** ; ...

...top-emitting white **OLED** ; ...

...up-emitting double-dopant white **OLED** structure...

...black-and-white active matrix **OLED** ;

*Waiting on*

11/3,K/3      (Item 3 from file: 2)  
DIALOG(R) File    2:INSPEC  
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6204244    INSPEC Abstract Number: A1999-09-7860F-006, B1999-05-4220-002

**Title: Efficient full color electroluminescence and stimulated emission with polyphenylenes**

Author(s): Leising, G.; List, E.J.W.; Zenz, C.; Tasch, S.; Brandstaetter, C.; Graupner, W.; Markart, P.; Meghdadi, F.; Kranzelbinder, G.; Niko, A.; Resel, R.; Zojer, E.; Schlichting, P.; Rohr, U.; Geerts, Y.; Scherf, U.; Mullen, K.; Smith, R.; Gin, D.

Author Affiliation: Inst. fur Festkorperphys., Tech. Univ. Graz, Austria

Journal: Proceedings of the SPIE - The International Society for Optical Engineering  
Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)  
vol.3476    p.76-87

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 1998    Country of Publication: USA

CODEN: PSISDG    ISSN: 0277-786X

SICI: 0277-786X(1998)3476L:76:EFCE;1-H

Material Identity Number: C574-1999-050

U.S. Copyright Clearance Center Code: 0277-786X/98/\$10.00

Conference Title: Organic Light-Emitting Materials and Devices II

Conference Sponsor: SPIE

Conference Date: 21-23 July 1998      Conference Location: San Diego, CA,  
USA

Language: English

Subfile: A B

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Abstract: We demonstrate the fabrication and characterization of highly efficient red - green - blue ( RGB ) and white light emitting devices based on poly(phenylene) type materials as the hexaphenyl and the methyl...

...composite is confirmed by X-ray diffraction analysis. The application of the nano-composites in organic - light - emitting - diodes is presented. A suitably structured m-LPPP waveguide shows a spectrally very narrow high directional...

...Identifiers: organic light emitting diodes ;

11/3,K/4 (Item 4 from file: 2)

DIALOG(R)File 2:INSPEC

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5911519 INSPEC Abstract Number: B9806-7260-047

Title: Performance of RGB multi-color organic EL display

Author(s): Matsuura, M.; Tokailin, H.; Eida, M.; Hosokawa, C.; Hironaka, Y.; Kusumoto, T.

Author Affiliation: Central Res. Labs., Idemitsu Kosan Co. Ltd., Chiba, Japan

Conference Title: Proceedings of Fifteenth International Display Research Conference. Asia Display '95 p.269-72

Publisher: Inst. Telev. Eng. Japan & SID, Tokyo, Japan & Santa Ana, CA, USA

Publication Date: 1995 Country of Publication: USA xxvi+981 pp.

Material Identity Number: XX95-01936

Conference Title: Proceedings of 15th International Display Research Conference

Conference Sponsor: Inst. Telev. Eng. Japan; SID

Conference Date: 16-18 Oct. 1995 Conference Location: Hamamatsu, Japan

Language: English

Subfile: B

Copyright 1998, IEE

Title: Performance of RGB multi-color organic EL display

Abstract: The authors present a RGB multi-color display of organic EL , which was realized as a new multi-color system in which a blue organic EL display was combined with color changing media (CCM). CCM are made up of organic fluorescent...

...the use of CCM, it was possible to obtain RGB colors based on a blue organic EL display. In this system, there are significant advantages over the previous multi-color systems; the efficiencies of RGB emission in this system are higher than that of the white display with color filters. The fabrication process of the system is simple as compared with the process of...

Identifiers: RGB multi-color organic EL display...

... organic EL ; ...

...blue organic EL display

11/3,K/5 (Item 5 from file: 2)

DIALOG(R)File 2:INSPEC

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5876836 INSPEC Abstract Number: B9805-7260-012

**Title:** The application of poly(phenylene) type polymers and oligomers in electroluminescent color displays

**Author(s):** Tasch, S.; Brandstatter, C.; Graupner, W.; Hampel, S.; Hochfilzer, C.; List, J.W.E.; Meghdadi, F.; Leising, G.; Schlichting, P.; Rohr, U.; Geerts, Y.; Scherf, U.; Mullen, K.

**Author Affiliation:** Inst. fur Festkorperphys., Tech. Univ. Graz, Austria

**Conference Title:** Flat Panel Display Materials III. Symposium p.325-30

**Editor(s):** Fulks, R.T.; Parsons, G.N.; Slobodin, D.E.; Yuzuriha, T.H.

**Publisher:** Mater. Res. Soc, Pittsburgh, PA, USA

**Publication Date:** 1997 **Country of Publication:** USA xi+338 pp.

**ISBN:** 1 55899 375 4 **Material Identity Number:** XX97-02853

**Conference Title:** Flat Panel Display Materials III. Symposium

**Conference Date:** 31 March-3 April 1997 **Conference Location:** San Francisco, CA, USA

**Language:** English

**Subfile:** B

**Copyright** 1998, IEE

...Abstract: the oligomer hexaphenyl, are very suitable materials for realisation of efficient, stable, large area blue organic light emitting diodes (OLEDs). The emission of blue OLEDs can be efficiently converted into all other emission colours...

... EL device is covered with highly fluorescent dye/matrix layers, which are excited by the blue emission and emit lower energy photoluminescent light. Secondly, a new method for producing efficient white light emitting polymer diodes (e.g. for backlight sources in liquid crystal displays) based on...

...Identifiers: organic light emitting diodes ; ...

... OLED efficiency...

... OLED stability...

...blue OLED emission conversion

11/3,K/6 (Item 6 from file: 2)

DIALOG(R) File 2:INSPEC

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5696373 INSPEC Abstract Number: B9710-4260D-037

**Title:** White and unsaturated color organic light emitting diodes

**Author(s):** Dodabalapur, A.; Strukelj, M.; Jordan, R.H.; Rothberg, L.J.; Miller, T.M.

**Author Affiliation:** AT&T Bell Labs., Murray Hill, NJ, USA

**Conference Title:** Electrical, Optical, and Magnetic Properties of Organic Solid State Materials III. Symposium p.59-63

**Editor(s):** Jen, A.K.-Y.; Lee, C.Y.-C.; Dalton, L.R.; Rubner, M.F.; Wnek, G.E.; Chiang, L.Y.

**Publisher:** Mater. Res. Soc, Pittsburgh, PA, USA

**Publication Date:** 1996 **Country of Publication:** USA xvi+710 pp.

**Material Identity Number:** XX96-02015

**Conference Title:** Electrical, Optical, and Magnetics Properties of Organic Solid State Materials III. Symposium

**Conference Date:** 27 Nov.-1 Dec. 1995 **Conference Location:** Boston, MA, USA

**Language:** English

**Subfile:** B



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**Title: White and unsaturated color organic light emitting diodes**

**Abstract:** We describe the principles of operation and device characteristics of novel **organic light emitting diodes** in which the emission originates in a number of optically active layers. The effective emission...

...can be controlled by adjusting the thicknesses of the individual layers, and in this manner **white** and other unsaturated **color** LEDs with external quantum **efficiency** >0.5% have been fabricated. The maximum luminance that has been achieved is ~4,700...

**Identifiers: organic light emitting diodes ;**

11/3,K/7 (Item 1 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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06797079 Genuine Article#: ZT437 No. References: 28

**Title: The effect of the thicknesses of the various layers on the colour emitted by an organic electroluminescent device**

**Author(s):** Jolinat P (REPRINT) ; Clergereaux R; Farenc J; Destruel P

**Corporate Source:** CNRS,ESA 5003, LAB GENIE ELECT TOULOUSE, 118 ROUTE NARBONNE/F-31062 TOULOUSE//FRANCE/ (REPRINT)

**Journal:** JOURNAL OF PHYSICS D-APPLIED PHYSICS, 1998, V31, N10 (MAY 21), P 1257-1262

**ISSN:** 0022-3727 **Publication date:** 19980521

**Publisher:** IOP PUBLISHING LTD, DIRAC HOUSE, TEMPLE BACK, BRISTOL BS1 6BE, ENGLAND

**Language:** English **Document Type:** ARTICLE (ABSTRACT AVAILABLE)

**Title: The effect of the thicknesses of the various layers on the colour emitted by an organic electroluminescent device**

**Abstract:** **Organic electroluminescent diodes** based on thin organic layers are one of the most promising next-generation systems...

...**Identifiers-- WHITE -LIGHT; BLUE ELECTROLUMINESCENCE; THIN-FILMS; DIODES; POLYMER; POLYANILINE; EFFICIENCY; COMPLEXES; EMISSION**

11/3,K/8 (Item 1 from file: 94)

DIALOG(R)File 94:JICST-EPlus

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04152944 JICST ACCESSION NUMBER: 99A0670211 FILE SEGMENT: JICST-E

**Organic EL Device with Quantum-Confined Structure.**

**OMORI YUTAKA (1); YOSHINO KATSUMI (1)**

(1) Osaka Univ., Grad. Sch.

**Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report (Institute of Electronics, Information and Communication Enginners), 1999, VOL.99,NO.137(OME99 23-33), PAGE.45-50, FIG.7, REF.5**

**JOURNAL NUMBER:** S0532BBG

**UNIVERSAL DECIMAL CLASSIFICATION:** 621.383:535.35

**LANGUAGE:** Japanese **COUNTRY OF PUBLICATION:** Japan

**DOCUMENT TYPE:** Journal

**ARTICLE TYPE:** Original paper

**MEDIA TYPE:** Printed Publication

**Organic EL Device with Quantum-Confined Structure.**

**ABSTRACT:** Recently, **organic electroluminescentdiode (EL) diodes** have

been extensively studied for high intensity, high efficiency, white light emission, and multi-color emission, and so on. Organic EL diodes have been developed to exhibit novel device characteristics utilizing quantum confined superlattice structure of dye molecules. In this report, enhanced emission from organic EL diodes with quantum confined superlattice structure has been discussed. (author abst.)

11/3,K/9 (Item 2 from file: 94)  
DIALOG(R)File 94:JICST-EPlus  
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03601350 JICST ACCESSION NUMBER: 98A0679919 FILE SEGMENT: JICST-E  
**R-G-B Emitting Multi-Color Organic EL Device.**  
OMORI YUTAKA (1); TADA NORIO (1); KUROSAKA TAKENORI (1); YOSHINO KATSUMI (1)  
(1) Osaka Univ., Grad. Sch.  
Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report (Institute of Electronics, Information and Communication Engineers), 1998, VOL.98,NO.138(OME98 24-33), PAGE.51-56, FIG.5, REF.13  
JOURNAL NUMBER: S0532BBG  
UNIVERSAL DECIMAL CLASSIFICATION: 621.383:535.35  
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan  
DOCUMENT TYPE: Journal  
ARTICLE TYPE: Original paper  
MEDIA TYPE: Printed Publication

**R-G-B Emitting Multi-Color Organic EL Device.**  
ABSTRACT: Recently, organic electroluminescent diode (EL) diodes have been extensively studied for high intensity, high efficiency, white light emission, and multi-color emission. Organic EL diodes have been developed to exhibit novel device characteristics. In this report, multi-color EL...

?

14/3,K/1 (Item 1 from file: 2)  
DIALOG(R)File 2:INSPEC  
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7316148 INSPEC Abstract Number: B2002-08-7260D-009

**Title: Optical characterization of OLED displays with touch screens**  
Author(s): Cropper, A.D.; Feldman, R.D.; Siwinski, M. ; Kilmer, K.  
Author Affiliation: Eastman Kodak Co., Rochester, NY, USA  
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)  
vol.4464 p.344-51  
Publisher: SPIE-Int. Soc. Opt. Eng,  
Publication Date: 2002 Country of Publication: USA  
CODEN: PSISDG ISSN: 0277-786X  
SICI: 0277-786X(2002)4464L:344:OCOD;1-2  
Material Identity Number: C574-2002-155  
U.S. Copyright Clearance Center Code: 0277-786X/02/\$15.00  
Conference Title: Organic Light-Emitting Materials and Devices V  
Conference Sponsor: SPIE  
Conference Date: 30 July-1 Aug. 2001 Conference Location: San Diego, CA, USA

Language: English  
Subfile: B  
Copyright 2002, IEE

**Title: Optical characterization of OLED displays with touch screens**  
Author(s): Cropper, A.D.; Feldman, R.D.; Siwinski, M. ; Kilmer, K.  
...Abstract: a thin aspect ratio are all well understood physical characteristics of organic light emitting diode (OLED) displays, an up-and-coming flat panel displays. Increasing numbers of applications of flat panel...

... describe the optical characteristics of mating a touch screen with a full-color active matrix OLED display. We will quantify the OLED optical properties with respect to touch screens with matte finishes and anti-reflective topcoats, and...

Identifiers: OLED displays with touch screens...

...full-color active matrix OLED display

14/3,K/2 (Item 1 from file: 8)  
DIALOG(R)File 8:Ei Compendex(R)  
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06172678 E.I. No: EIP02437155864

**Title: Optical characterization of OLED displays with touch screens**  
Author: Feldman, Rodney D.; Siwinski, Michael ; Kilmer, Kathleen; Cropper, A.D.

Corporate Source: Eastman Kodak Company, Rochester, NY 14650-1821, United States

Conference Title: Organic Light-Emitting Materials and Devices V  
Conference Location: San Diego,CA, United States Conference Date: 20010730-20010801

E.I. Conference No.: 59972  
Source: Proceedings of SPIE - The International Society for Optical Engineering v 4464 2002. p 344-351  
Publication Year: 2002  
CODEN: PSISDG ISSN: 0277-786X  
Language: English

**Title: Optical characterization of OLED displays with touch screens**  
**Author: Feldman, Rodney D.; Siwinski, Michael ; Kilmer, Kathleen; Cropper, A.D.**

...Abstract: lower power consumption, and a thin aspect ratio are all well understood physical characteristics of **organic light emitting diode ( OLED )** displays, an up-and-coming flat panel displays. Increasing numbers of applications of flat panel...

...describe the optical characteristics of mating a touch screen with a full-color active matrix **OLED** display. We will quantify the **OLED** optical properties with respect to touch screens with matte finishes and anti-reflective topcoats, and...

**14/3,K/3 (Item 1 from file: 65)**  
DIALOG(R)File 65:Inside Conferences  
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04133739 INSIDE CONFERENCE ITEM ID: CN043405007  
**Optical characterization of OLED displays with touch screens ( 4464-58)**  
Cropper, A. D.; Feldman, R. D.; **Siwinski, M. ; Kilmer, K.**  
CONFERENCE: Organic light-emitting materials and devices-Conference; 5th PROCEEDINGS-SPIE THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, 2002  
; VOL 4464 P: 344-351  
SPIE, 2002  
ISSN: 0277-786X ISBN: 0819441783  
LANGUAGE: English DOCUMENT TYPE: Conference Selected papers  
CONFERENCE EDITOR(S): Kafafi, Z.  
CONFERENCE SPONSOR: International Society for Optical Engineering  
CONFERENCE LOCATION: San Diego, CA 2001; Jul (200107) (200107)

**Optical characterization of OLED displays with touch screens ( 4464-58)**  
Cropper, A. D.; Feldman, R. D.; **Siwinski, M. ; Kilmer, K.**  
DESCRIPTORS: organic light-emitting materials; SPIE; light-emitting devices; light emitting materials; **organic light emitting devices ; light-emitting devices**

File 344:Chinese Patents Abs Aug 1985-2003/Apr  
(c) 2003 European Patent Office  
File 347:JAPIO Oct 1976-2003/Jul(Updated 031105)  
(c) 2003 JPO & JAPIO  
File 348:EUROPEAN PATENTS 1978-2003/Nov W02  
(c) 2003 European Patent Office  
File 349:PCT FULLTEXT 1979-2002/UB=20031113,UT=20031106  
(c) 2003 WIPO/Univentio  
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200374  
(c) 2003 Thomson Derwent  
? ds

Set	Items	Description
S1	19	AU=(SIWINSKI, M? OR SIWINSKI M?)
S2	8521	CO=(EASTMAN(W)KODAK()COMPANY)
S3	19	IDPAT S1 (sorted in duplicate/non-duplicate order)
S4	11	IDPAT S1 (primary/non-duplicate records only)
S5	2	S4 AND (IC=(G09G-003/32 OR G09G-005/00) OR OLED OR ORGANIC-(W)(LED OR LIGHT()EMIT?() (DEVICE? ? OR DIODE? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL))
S6	202	S2 AND (IC=(G09G-003/32 OR G09G-005/00) OR OLED OR ORGANIC-(W)(LED OR LIGHT()EMIT?() (DEVICE? ? OR DIODE? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL))
S7	67	S6 AND WHITE
S8	67	IDPAT (sorted in duplicate/non-duplicate order)
S9	67	IDPAT (primary/non-duplicate records only)
S10	0	S9 AND S4 NOT S5
S11	65	S7 AND (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RGB) NOT S5
S12	11	S11(S)WHITE(S) (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR - RGB) (S)S6
S13	11	IDPAT (sorted in duplicate/non-duplicate order)
S14	186	AU=(KIDO, J? OR KIDO J?)
S15	10780	AU=(KIMURA, M? OR KIMURA M?)
S16	5827	AU=(NAGAI, K? OR NAGAI K?)
S17	0	S14 AND S15 AND S16
S18	35	(S14 OR S15 OR S16) AND IC=(G09G-003/32 OR G09G-005/00)
S19	0	S18(S)WHITE(S) (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR - RGB) (S) (OLED OR ORGANIC(W) (LED OR LIGHT()EMIT?() (DEVICE? ? OR DIODE? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL))

5/3,K/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

015394033 \*\*Image available\*\*  
WPI Acc No: 2003-456174/200343  
XRPX Acc No: N03-362752

Power saving method for color organic electroluminescent display of  
personal computer, involves converting color digital image into  
monochrome image using color of specific elements

Patent Assignee: EASTMAN KODAK CO (EAST )

Inventor: SIWINSKI M J

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020180723	A1	20021205	US 2001874147	A	20010605	200343 B

Priority Applications (No Type Date): US 2001874147 A 20010605

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20020180723	A1		5 G09G-005/00	

Power saving method for color organic electroluminescent display of  
personal computer, involves converting color digital image into  
monochrome image using color of...

Inventor: SIWINSKI M J

Abstract (Basic):

... An INDEPENDENT CLAIM is included for color organic  
electroluminescent display...

...For saving power in color organic electroluminescent display panel  
used in electronic device such as personal computer (PC), personal  
digital assistant (PDA...

International Patent Class (Main): G09G-005/00

5/3,K/2 (Item 2 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv..

015267764 \*\*Image available\*\*  
WPI Acc No: 2003-328693/200331  
XRPX Acc No: N03-262872

Color organic electroluminescent display power saving method for  
personal computer, involves converting color digital image into  
monochrome image which is displayed using white light emitting elements  
of display

Patent Assignee: EASTMAN KODAK CO (EAST )

Inventor: SIWINSKI M J

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020186214	A1	20021212	US 2001874128	A	20010605	200331 B

Priority Applications (No Type Date): US 2001874128 A 20010605

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20020186214	A1		6 G09G-005/00	

*none*

Color organic electroluminescent display power saving method for personal computer, involves converting color digital image into monochrome image...

Inventor: SIWINSKI M J

Abstract (Basic):

... An INDEPENDENT CLAIM is included for color organic electroluminescent display...

...For saving power in color organic electroluminescent flat panel display (claimed) such as organic light emitting diodes (OLEDs) used in personal computer, personal digital assistant, laptop computer, cellular telephone, etc...

International Patent Class (Main): G09G-005/00

?

13/3,K/1 (Item 1 from file: 348)  
DIALOG(R) File 348:EUROPEAN PATENTS  
(c) 2003 European Patent Office. All rts. reserv.

01640552

**Desiccant structures for oled displays**  
**Trockenmittelstrukturen fur oled Anzeigen**  
**Structures deshydratants pour dispositifs d'affichage oled**

PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York  
14650, (US), (Applicant designated States: all)

INVENTOR:

Cok, Ronald Steven, c/o Eastman Kodak Company, Patent Legal Staff, 343  
State Street, Rochester, New York 14650-2201, (US)  
Boroson, Michael Louis, c/o Eastman Kodak Company, Patent Legal Staff,  
343 State Street, Rochester, New York 14650-2201, (US)  
O'Toole, Terrence Robert, Eastman Kodak Company, Patent Legal Staff, 343  
State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement  
Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)  
PATENT (CC, No, Kind, Date): EP 1351323 A2 031008 (Basic)  
APPLICATION (CC, No, Date): EP 2003075823 030324;  
PRIORITY (CC, No, Date): US 116307 020404  
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR;  
HU; IE; IT; LI; LU; MC; NL; PT; SE; SI; SK; TR  
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO  
INTERNATIONAL PATENT CLASS: H01L-051/20  
ABSTRACT WORD COUNT: 63

NOTE:

Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English  
FULLTEXT AVAILABILITY: -

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200341	174
SPEC A	(English)	200341	4743
Total word count - document A			4917
Total word count - document B			0
Total word count - documents A + B			4917

...SPECIFICATION the first electrodes 18 is exposed.

Over the first electrodes and insulating layers are provided **red**, **green**, and **blue** -emitting **organic electroluminescent** (EL) elements, 19R, 19G, and 19B, respectively. Herein, the collection of **organic EL** elements may also be referred to as the **organic EL** layer. The light-emitting pixel area is generally defined by the area of the first electrode 18 in contact with the **organic EL** elements. Over the **organic EL** layer is provided a transparent, common second electrode 30 that has sufficient optical transparency to allow transmission of the generated **red**, **green**, and **blue** light. Each first electrode in combination with its associated **organic EL** element and second electrode is herein referred to as an **OLED** element. A typical top-emitting **OLED** display device comprises an array of **OLED** elements wherein each **OLED** element emits **red**, **green** or **blue**. However, monochrome display devices are also known where the array of **OLED** elements emit the same **color** light, for example, **white**.

In operation, the thin-film transistors in TFT layer 14 allow current to flow between...light is patterned, and the other layers may be uniformly deposited over the entire device.



OLED devices of this invention can employ various well-known optical effects in order to enhance....

...the display, providing a polarizing medium over the display, or providing colored, neutral density, or color conversion filters over the display. Filters, polarizers, and anti-glare or anti-reflection coatings may...

...the cover or as part of the cover. In another embodiment of this invention, the OLED elements may emit white light and a RGB filter array is provided over the white-emitting OLED elements to provide a full color display device.

13/3,K/2 (Item 2 from file: 348)  
DIALOG(R) File 348:EUROPEAN PATENTS  
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01624311

Organic electroluminescent device having stacked electroluminescent units  
Organische elektrolumineszente Anordnung mit gestapelten  
elektrolumineszenten Elementen  
Dispositif electroluminescent organique comportant des elements  
electroluminescents empiles

PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York  
14650, (US), (Applicant designated States: all)

INVENTOR:

Liao, Liang-Sheng L., c/o Eastman Kodak Company, 343 State Street,  
Rochester, New York 14650-2201, (US)  
Tang, Ching Wan, c/o Eastman Kodak Company, 343 State Street, Rochester,  
New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement  
Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)  
PATENT (CC, No, Kind, Date): EP 1339112 A2 030827 (Basic)  
APPLICATION (CC, No, Date): EP 2003075309 030203;  
PRIORITY (CC, No, Date): US 77270 020215  
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR;  
HU; IE; IT; LI; LU; MC; NL; PT; SE; SI; SK; TR  
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO  
INTERNATIONAL PATENT CLASS: H01L-051/20  
ABSTRACT WORD COUNT: 87

NOTE:

Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English  
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200335	339
SPEC A	(English)	200335	11969
Total word count - document A			12308
Total word count - document B			0
Total word count - documents A + B			12308

...SPECIFICATION or lifetimes. A few non-limiting examples are discussed below.

White-Emitting Devices

By using RGB stacks, this invention enables white light generation

at greatly improved efficiency and operational lifetime compared to OLED devices of the prior art. One application for this improved white light-producing, stacked OLED is in general purpose or area lighting, where high luminance originated from a large surface area is desirable. FIG. 7 illustrates an example of a white light-emitting structure that can be used as an area lighting device or lamp 350...

...cathode 240 and anode 210 of the lamp via electrical conductors 260. In this example, organic EL unit 220.1 emits blue light, organic EL unit 220.2 emits green light, and organic EL unit 220.3 emits red light. The intensity and exact hue of light emission from each organic EL unit is chosen so that they combine to yield white light, or nearly white light. Doped organic connectors 230.1 and 230.2 are as defined previously. There are many other combinations of organic EL units that can be used to yield light that appears white. For example, two-layer structures that emit blue and yellow light, or that emit red and cyan light, or that emit green and magenta light, can be used to generate white light. In all cases these units can be combined multiple times. For example, one can use several RGB stacks in a single device

Another application is in full color displays where white light is generated by each pixel and filtered using RGB filters. That is, an RGB filter is provided between the display and a viewer. This simplifies manufacturing because it is generally easier to apply a RGB filter after OLED device fabrication than to pattern RGB emitting pixels. While there are manufacturing advantages, this RGB filter method suffers greatly from lost efficiency since the filter wastes much of the generated light. A high efficiency RGB stack of this invention allows for the fabrication of a filtered RGB display that is not disadvantaged in terms of efficiency relative to a conventional patterned emissive RGB OLED of the prior art, and maintains the manufacturing advantage.

FIGS 8 and 9 illustrate a non-limiting example of a matrix array of white light-emitting stacked OLED devices that can be used to fabricate a full-color matrix display. FIG. 8 is a cutaway schematic showing one example of electrical circuitry that can be used to independently activate each stacked OLED device (that is, each pixel). This matrix array is commonly referred to as an active...

...TFTs) for current control TC11, TC21, TC31, ..., TC12, TC22, TC23, TC31, TC32, TC33, ..., TCnm, stacked OLED devices EL11, EL21, EL31, ..., EL12, EL22, EL23, ..., EL31, EL32, EL33, ..., ELnm, capacitors C11, C21, C31...

...state. Thus, an electric current supplied from a power supply line Vdd flows in the organic EL pixel, which results in light emission.

FIG. 9 is a cross-sectional schematic diagram illustrating...

...color matrix display 600. Display 600 uses white light emission from an array of stacked organic electroluminescent devices (ELnm) and an array of color filters in registration with the devices. The color filters are situated between the devices and the viewer. Provided over transparent support 601 (typically...

...602 and 603, and the wiring, capacitors, and transistors necessary to drive the individual stacked OLED devices or pixels in the array. For clarity, the electrical wiring, capacitors, and transistors in...

...to reveal the anode pads. Provided over the anode pads and organic insulator 603 is white -light emitting organic layer 605 comprising a

stack of two or more **organic EL** units and doped organic connectors as taught in this invention, necessary to yield **white** light emission. For example, a stack of **red**, **green**, and **blue** -emitting units, or a stack of **blue** and yellow-emitting units can all be effective. These **organic EL** units can be deposited over the entire display device. This is followed by deposition of cathode 640, which is common to each stacked **OLED** device. When activated, **white** light is emitted through the transparent anode 610, transparent organic insulator, 602, and through the transparent substrate 601. The emission area of each stacked **OLED** device (pixel) is defined by the contact area with the anode. Provided on the surface of the transparent substrate opposite the matrix array of **white** light-emitting **organic electroluminescent** devices, is an array of **red** (651), **green** (652), and **blue** (653) filters that are positioned in registration with each pixel. Thus, in FIG. 9, **white** light generated by EL11 appears **red**, **white** light generated by EL12 appears **green**, and **white** light generated by EL13 appears **blue**. Materials and methods for depositing **color** filter arrays on glass substrates are well known in the art.

#### Color -Conversion Displays

Another application of this invention is in devices or displays that utilize blue...matrix array of stacked organic electroluminescent devices according to claim 8, wherein each device emits **white** light by stacking **red**, **green**, and **blue** -emitting **organic electroluminescent** units;

(b) means for independently electrically activating each device; and

(c) an array of red...layer.

The stacked organic electroluminescent device comprising at least three organic electroluminescent units such that **red**, **green**, and **blue** -emitting units are combined to yield **white** light.

The stacked organic electroluminescent device wherein the organic electroluminescent units emit essentially the same...

...layer.

The stacked organic electroluminescent device comprising at least three organic electroluminescent units such that **red**, **green**, and **blue** -emitting units are combined to yield **white** light.

The stacked organic electroluminescent device wherein the organic electroluminescent units emit essentially the same...layer.

The stacked organic electroluminescent device comprising at least three organic electroluminescent units such that **red**, **green**, and **blue** -emitting units are combined to yield **white** light.

The stacked organic electroluminescent device wherein the organic electroluminescent units emit essentially the same...

...CLAIMS matrix array of stacked organic electroluminescent devices according to claim 1, wherein each device emits **white** light by stacking **blue** and yellow-emitting **organic electroluminescent** units, or by stacking **green** and magenta-emitting **organic electroluminescent** units, or by stacking **red** and cyan-emitting **organic electroluminescent** units;

(b) means for independently electrically activating each device; and

(c) an array of red...

Digital/analog recording using near field optical imaging  
Analog/Digital Aufzeichnung unter Verwendung der optischen Nahfeldabbildung  
Enregistrement analogique/numerique par imagerie optique a champ proche  
PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York  
14650, (US), (Applicant designated States: all)

INVENTOR:

Spoonhower, John P., c/o Eastman Kodak Company, Patent Legal Staff, 343  
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Patton, David Lynn, c/o Eastman Kodak Company, Patent Legal Staff, 343  
State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

Haile, Helen Cynthia et al (60522), Kodak Limited Patent, W92-3A,  
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PATENT (CC, No, Kind, Date): EP 1310950 A2 030514 (Basic)

APPLICATION (CC, No, Date): EP 2002079322 021017;

PRIORITY (CC, No, Date): US 45805 011029

DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR;  
IE; IT; LI; LU; MC; NL; PT; SE; SK; TR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G11B-007/0045; G11B-007/20; G11B-007/24

ABSTRACT WORD COUNT: 126

NOTE:

Figure number on first page: 1A, 1B

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200320	321
SPEC A	(English)	200320	4180
Total word count - document A			4501
Total word count - document B			0
Total word count - documents A + B			4501

...SPECIFICATION means such as a softcopy display. The image 10 can be  
black and white or color . The softcopy display can be a CRT, organic  
light emitting diode ( OLED ) display, or other similar type device.  
Using near-field optics, the image 10 is formed...range capable of  
capturing the intensity variation in the original scene, unless simple  
black and white images are all that is required.

Referring now to Fig. 5a, the image(s) 10...

13/3,K/4 (Item 4 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

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01560937

Organic light emitting diode having an interface layer between the  
hole-transporting layer and the light-emitting layer

Organische Licht emittierende Diode mit einer Zwischenschicht zwischen der  
Locher transportierenden Schicht und der Licht emittierenden Schicht

Diode electroluminescente organique avec une couche intermediaire entre la  
couche transporteuse de trous et la couche electroluminescente

PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York  
14650, (US), (Applicant designated States: all)

INVENTOR:

Liao, L.-S., c/o Eastman Kodak Company, Patent Legal Staff, 343 State  
Street, Rochester, New York 14650-2201, (US)

Madathil, J. K., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)  
Klubek, K. P., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)  
Tang, C. W., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)  
PATENT (CC, No, Kind, Date): EP 1298737 A2 030402 (Basic)  
APPLICATION (CC, No, Date): EP 2002078794 020916;  
PRIORITY (CC, No, Date): US 966618 010928  
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; SK; TR  
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI  
INTERNATIONAL PATENT CLASS: H01L-051/20  
ABSTRACT WORD COUNT: 111

NOTE:

Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English  
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200314	274
SPEC A	(English)	200314	3720
Total word count - document A			3994
Total word count - document B			0
Total word count - documents A + B			3994

...SPECIFICATION to the emissive dopant molecules. In a preferred embodiment, this invention can be used in **OLED** devices that emit **red**, **green**, or **blue** light, and all combinations thereof, including **white** light.

Organic materials useful for the electron-transporting layer 106 have been disclosed by Tang...

...CLAIMS or greater than that of the organic compound of the light-emitting layer.

2. The **organic light - emitting device** as in claim 1 wherein the light-emitting layer emits **blue**, **green**, **red**, or **white** light.
3. The organic light-emitting device as in claim 1 wherein the thickness of...

13/3,K/5 (Item 5 from file: 348)

DIALOG(R) File 348:EUROPEAN PATENTS

(c) 2003 European Patent Office. All rts. reserv.

01543232

White organic light-emitting devices with improved efficiency  
Weisses Licht emittierende Vorrichtung mit verbessertem Wirkungsgrad  
Dispositif d'emission de lumiere blanche avec un rendement ameliore  
PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)

INVENTOR:

Hatwar, Tukaram Kisan, c/o Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)

PATENT (CC, No, Kind, Date): EP 1286569 A1 030226 (Basic)  
APPLICATION (CC, No, Date): EP 2002078223 020805;  
PRIORITY (CC, No, Date): US 930050 010815  
DESIGNATED STATES: DE; FR; GB  
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI  
INTERNATIONAL PATENT CLASS: H05B-033/14; H05B-033/22; H05B-033/28  
ABSTRACT WORD COUNT: 144  
NOTE:

Figure number on first page: 3

LANGUAGE (Publication,Procedural,Application): English; English; English  
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200309	440
SPEC A	(English)	200309	6104
Total word count - document A			6544
Total word count - document B			0
Total word count - documents A + B			6544

...ABSTRACT A1

An organic light-emitting diode ( **OLED** ) device which produces substantially **white** light includes a substrate; an anode disposed over the substrate; and a hole injecting layer...

...transport layer disposed over the hole injecting layer; a light-emitting layer doped with a **blue** light-emitting compound, disposed directly on the hole transport layer; and an electron transport layer disposed over the **blue** light-emitting layer. The device further includes a cathode disposed over the electron transport layer...

...to an entire layer or a partial portion of a layer in contact with the **blue** light-emitting layer, the selective doping being with a compound which emits light in the...

...SPECIFICATION device in their US-A-4,769,292 and US-A-4,885,211.

Efficient **white** light producing **OLED** devices are considered as low cost alternative for several applications such as paper-thin light sources backlights in LCD displays, automotive dome lights and office lighting. **White** light producing **OLED** devices should be bright, efficient, and generally have Commission International d'Eclairage (CIE) chromaticity coordinates of about (0.33, 0.33). In any event, in accordance with this disclosure, **white** light is that light which is perceived by a user as having a **white color**.

The following patents and publications disclose the preparation of organic **OLED** devices capable of emitting...

...hole transport layer and an organic luminescent layer, and interposed between a pair of electrodes.

**White** light producing **OLED** devices have been reported before by J. Shi (US-A-5,683,823) wherein, the luminescent layer includes a **red** and **blue** light-emitting materials uniformly dispersed in a host emitting material. This device has good electroluminescent characteristics, but the concentration of the **red** and **blue** dopants are very small such as 0.12% and 0.25% of the host material...

...control during large-scale manufacturing.

Sato and others in JP 07,142,169 discloses an **OLED** device, capable of emitting **white** light, is made by sticking a **blue** light-emitting layer next to the hole transporting layer and followed by a **green** light-emitting layer having a region containing a **red** fluorescent layer.

Kido and others, in Science, Vol. 267, p. 1332 (1995) and in APL Vol.

64, p. 815 (1994) report a white light producing OLED device. In this device three emitter layers with different carrier transport properties, each emitting blue, green or red light, are used to generate white light.

Littman and others in US-A-5,405,709 disclose another white emitting device...

...red.

Recently, Deshpande and others, in Applied Physics Letters, vol. 75, p. 888 (1999) published white OLED device using red, blue and green luminescent layers separated by a hole blocking layer.

However, these OLED devices require very small...

...and which can be reproduced in manufacturing environment.

It has been found quite unexpectedly that white light producing OLED devices with high luminance efficiency and operational stability can be obtained by doping yellow dopant in the NPB hole transport layer, blue dopant in the TBADN host emission layer and green dopant in the Alq electron transport layer.

The object is achieved by an organic light independently;

3) the white OLED device can be used with pre-patterned substrate with having R, G, B color filters to produce a full color device;

4) an OLED device which is easy to control blue, yellow and green dopant...as Device 2 except that 10 nm Alq layer was doped with 0.12% C545T green dopant then followed by 25 nm undoped Alq. This device has significantly improved luminance yield and CIE<sub>x,y</sub> coordinates similar to that device 2. Also noteworthy is the green emission peak around 520 nm as also is shown in the FIG. 8. This green portion was absent in the spectra of device 2. The device 3 overall has white color emission but with much higher luminance yield of that device 2. Thus, it was possible to produce white color with increased efficiency by green dopant in the Alq electron transport layer. The individual contribution of each of the color is particularly important, if white OLED light is used in combination with the R, G, B color filters to produce a full color OLED device. In turn, the individual R, G, B contributions to the full color OLED can be engineered by using the present invention.

#### Comparative Example 4

Device 4 was prepared...

...in the Alq electron transport

FIG. 9 shows the luminance yield as a function of green C545T dopant % into the Alq electron transport layer. Again the luminance efficiency of the white OLED can be increased without adversely affecting the color of the white emitting OLED.

#### Comparative Example 6

Device 6 has structure similar to FIG. 5. It was prepared following... 2% Rubrene. This device has overall white emission and efficiency similar to device 9.

The white OLED emission can be used to prepare a full color device using the R, G, B color filters. The color filters are deposited either on the substrate or the white OLED device. In this case, white OLED is used as a backlight. Generally R, G, B color filters are integrated on the substrate using the microlithography patterning. This technique of producing of full color light has several advantages over the precision shadow masking technology used for producing the full...

...Hsieh describe the addressing methods of the TFT substrates. Some other techniques for preparing full color devices using the white OLEDs are

given in an article by P.F. Burrows and others, IEEE Trans. Electron...  
white light;

b) a plurality of colored filters corresponding to different ones of  
the selectable **OLED** devices such that when **white** light passes through  
such filter, a particular **color** will be produced; and

c) means for selecting OLED devices to cause them to produce...

13/3,K/6 (Item 6 from file: 348)

DIALOG(R) File 348:EUROPEAN PATENTS

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01408944

**Organic electroluminescent device with supplement cathode bus conductor**  
**Organische electrolumineszente Vorrichtung mit einer zusatzlichen**  
**Kathodenbusleitung**

**Dispositif organique electroluminescent avec un conducteur de type bus**  
**cathodique supplementaire**

PATENT ASSIGNEE:

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INVENTOR:

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LEGAL REPRESENTATIVE:

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PATENT (CC, No, Kind, Date): EP 1191593 A2 020327 (Basic)

APPLICATION (CC, No, Date): EP 2001203403 010910;

PRIORITY (CC, No, Date): US 667293 000922

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;  
LU; MC; NL; PT; SE; TR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: H01L-027/00

ABSTRACT WORD COUNT: 189

NOTE:

Figure number on first page: 8

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
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CLAIMS A	(English)	200213	1234
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SPEC A	(English)	200213	6463
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Total word count - document A	7697
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Total word count - document B	0
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Total word count - documents A + B	7697
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...SPECIFICATION or device having only four cathodes and four anodes.

Additionally, the drawings show a single **organic electroluminescent**  
(EL) medium layer which, in actual practice, can include several layers,  
for example, organic hole...

...hole-transporting layers, an organic light-emitting layer which may emit  
light of a single **color** or hue, or which can emit one of **red**, **green**  
, or **blue** light (R, G, B) by appropriate doping of an organic  
light-emitting host material with...

...organic luminescent dopant material at selected pixel positions, and an  
organic electron-transporting layer. The **organic electroluminescent**  
medium can also emit **white** light by appropriate choice of emitting



dopants. Alternatively, the **organic EL** medium layer can include one or more organic polymeric layers capable of light-emission.  
The...

13/3,K/7 (Item 7 from file: 348)  
DIALOG(R) File 348:EUROPEAN PATENTS  
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01403127  
White organic electroluminescent devices with improved stability and efficiency  
Weiss ausstrahlende organische Elektrolumineszenzvorrichtung mit verbessertem Wirkungsgrad und verbesserter Stabilität  
Dispositif electroluminescent emettant de la lumiere blanche avec efficacite et stabilite ameliorees

PATENT ASSIGNEE:

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INVENTOR:

Hatwar, Tukaram K., Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

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PATENT (CC, No, Kind, Date): EP 1187235 A2 020313 (Basic)

APPLICATION (CC, No, Date): EP 2001203130 010817;

PRIORITY (CC, No, Date): US 651624 000830

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: H01L-051/20

ABSTRACT WORD COUNT: 142

NOTE:

Figure number on first page: 5

LANGUAGE (Publication,Procedural,Application): English; English; English  
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200211	439
SPEC A	(English)	200211	5877
Total word count - document A			6316
Total word count - document B			0
Total word count. - documents A + B			6316

...ABSTRACT A2

An organic light-emitting diode ( **OLED** ) device which produces substantially **white** light includes a substrate; an anode disposed over the substrate; and a hole-injecting layer...

...transport layer disposed over the hole-injecting layer; a light-emitting layer doped with a **blue** light-emitting compound, disposed directly on the hole transport layer; and an electron transport layer disposed over the **blue** light-emitting layer. The device further includes a cathode disposed over the electron transport layer...

...to an entire layer or a partial portion of a layer in contact with the **blue** light-emitting layer, the selective doping being with a compound which emits light in the...

...SPECIFICATION is described in US-A-4,769,292 and US-A-4,885,211.

Efficient **white** light producing **OLED** devices are considered low cost alternative for several applications such as paper-thin light source backlights in LCD displays, automotive dome lights, and office lighting. **White** light producing **OLED** devices should be bright, efficient, and generally have Commission International d'Eclairage (CIE) chromaticity coordinates of about (0.33, 0.33). In any event, in accordance with this disclosure, **white** light is that light which is perceived by a user as having a **white** color.

The following patents and publications disclose the preparation of organic **OLED** devices capable of emitting...

...hole transport layer and an organic luminescent layer, and interposed between a pair of electrodes.

**White** light producing **OLED** devices have been reported before by in US-A-5,683,823 wherein the luminescent layer includes a **red** and **blue** light-emitting materials uniformly dispersed in a host emitting material. This device has good electroluminescent characteristics, but the concentration of the **red** and **blue** dopants are very small such as 0.12% and 0.25% of the host material...

...control during large-scale manufacturing.

Sato and others in JP 07,142,169 discloses an **OLED** device capable of emitting **white** light made by sticking a **blue** light-emitting layer next to the hole transporting layer and followed by a **green** light-emitting layer having a region containing a **red** fluorescent layer.

Kido and others, in Science, Vol. 267, p. 1332 (1995) and in APL Vol. 64, p. 815 (1994), report a **white** light producing **OLED** device. In this device three emitter layers with different carrier transport properties, each emitting **blue**, **green** or **red** light, are used to generate **white** light.

US-A-5,405,709 discloses another white emitting device which is capable of...

...red.

Recently, Deshpande and others, in Applied Physics Letters, vol. 75, p. 888 (1999) published **white** **OLED** device using **red**, **blue** and **green** luminescent layers separated by a hole blocking layer.

However, these **OLED** devices require a very...

...and which can be reproduced in manufacturing environment.

It has been found quite unexpectedly that **white** light producing **OLED** devices with high luminance efficiency and operational stability can be obtained by doping yellow dopant in the NPB hole transport layer and **blue** dopant in the ADN host emission layer.

It has also been found that by doping...shows relative luminance change as a function of operation time for the five devices: (AA) **Blue** device, (AC) 0.5% doping into ETL layer, (AD) **White** **OLED** with 1.5 % rubrene doping in HTL layer; (AE) and (AF) **White** **OLED** devices with rubrene doping both in HTL and ETL layers.

A conventional light-emitting layer...rubrene concentration was increased from 0 to 5% in the hole transport NPB layer. The **blue** emission layer consists of 1.5% TBP doped in the ADN host. **White** color with CIE coordinates (0.33, 0.38) is obtained with luminance efficiency greater than 4...

...is about 1.5 - 2%. Thus, much higher concentrations of rubrene yellow dopant and TBP **blue** doping can be used. The luminance efficiency and the CIE coordinates as a function of...

...shown in Table 1. Device D has luminance yield of 4.3 cd/A and color chromaticity coordinates of CIE x,y = 0.33, 0.38 @20 mA/cm<sup>2</sup> current density...

...this invention in that doping rubrene in the NPB hole transport layer adjacent to a blue light emission layer can produce white light OLED

It was found that the thickness of the rubrene yellow doped region of the NPB...

...region of the NPB hole transport layer 341a should be in close contact with the blue luminescent layer 342 for obtaining high efficiency white light producing OLED devices as illustrated from the following Example 2.

#### Example 2

OLED Devices G, H, I...

...that the emission becomes confined to the blue emission layer.

It was found that a white producing OLED can also be made by doping yellow rubrene dopant into Alq electron transport layer adjacent to a blue light emission layer. FIG. 6 shows an organic white light-emitting OLED device 600. The layer numbers are the same as corresponding to FIG. 3. An organic white light-emitting structure 640 is formed between the anode 220 and a cathode 230. The white light-emitting structure 640 is comprised of, in sequence, an organic hole-transporting layer 341, an organic light-emitting layer 342 which is blue emitting layer comprising ADN host and TBP dopant, and an organic electron-transporting layer 343a...region of the Alq electron transport layer 343a should be in close contact with the blue luminescent layer 342 for obtaining high efficiency white light producing OLED devices. This is illustrated by the following Example 4.

#### Example 4

OLED devices S to...

...that is from the blue emission layer.

Another important feature of this invention is that white light can be produced by an OLED by doping rubrene both in the NPB hole transport layer 341a and in the Alq electron transport layer 343a, and blue emitting layer 342. These devices have significantly higher luminance yield and higher operational stability as...

...in either hole transport layer or the electron transport layer.

FIG. 9 shows an organic white light-emitting OLED device 900 wherein rubrene was doped both in the hole transport 341a and the electron...

...The numbers for other layers are the same as corresponding to FIG. 3. An organic white light-emitting structure 940 is formed between the anode 220 and a cathode 230. The white light-emitting structure 940 is comprised of, in sequence, an organic hole-transporting layer 341a doped with rubrene, an organic light-emitting layer 342 which is blue emitting layer comprising ADN host and TBP dopant, and an organic electron-transporting layer 343a...

...Table 5. Devices AE and AF have luminance yield of 5.3 cd/A and color chromaticity coordinates of CIE x,y = 0.35, 0.38 @20 mA/cm<sup>2</sup> current density. This luminance efficiency is higher than the white OLED devices obtained by rubrene doping either in the NPB hole transport layer or in the...mA/cm<sup>2</sup> current density. These devices are described in Example 5. Device AA is a blue device. Device AC and AD are white

devices obtained by doping rubrene into Alq electron transport layer and NPB hole transport layer, respectively. Devices AE and AF are also white devices, except that the yellow rubrene was doped both in the NPB hole transport layer...

...and the drive voltage. Thus, these devices have the highest operational stability among the five OLED devices. When rubrene was doped both in the NPB hole transport layer as well as Alq electron transport layer adjacent to the blue emission layer, the synergistic effect was such that significantly better operational stability and efficiency were obtained for the white OLED devices.

Thus, the white OLED devices of this invention prepared by doping rubrene into either NPB hole transport layer or...

...hole transport layer and the electron transport layer have significantly improved operational fade stability. These OLED devices have higher luminance yield and lower drive voltage. These OLED devices can be operated at higher current density with minimum degradation in the color coordinates and the luminance efficiency.

Other features of the invention are included below.

The OLED...

13/3,K/8 (Item 8 from file: 348)  
DIALOG(R) File 348:EUROPEAN PATENTS  
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00988042

Compact image sensor with display integrally attached  
Kompakter Bildsensor mit daran befestigter Bildanzeigevorrichtung  
Capteur d'image compact attache a un dispositif d'affichage

PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York  
14650, (US), (Applicant designated States: all)

INVENTOR:

Meyers, Mark Marshall, Eastman Kodak Company, 343 State Street,  
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LEGAL REPRESENTATIVE:

Lewandowsky, Klaus, Dipl.-Ing. et al (7581), Kodak Aktiengesellschaft,  
Patentabteilung, 70323 Stuttgart, (DE)

PATENT (CC, No, Kind, Date): EP 893915 A2 990127 (Basic)  
EP 893915 A3 000105

APPLICATION (CC, No, Date): EP 98201979 980612;

PRIORITY (CC, No, Date): US 882446 970625

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;  
LU; MC; NL; PT; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: H04N-005/335; H04N-005/225; H04N-003/15

ABSTRACT WORD COUNT: 101

NOTE:

Figure number on first page: 1

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9904	654
SPEC A	(English)	9904	7165
Total word count - document A			7819
Total word count - document B			0
Total word count - documents A + B			7819

...SPECIFICATION display 302 is comprised of a number of emissive pixels 304 capable of outputting either white, red, green, or blue light for presenting a Gray scale or color image of the photographic scene being captured or reviewed for capture. These emissive pixels 304 can be electroluminescent materials or organic light emitting diode materials such as those described in U.S. Patents 5,151,629, titled, "Blue Emitting Internal Junction Organic Electroluminescent Device (I)" by VanSlyke, and 5,126,214, titled "Electroluminescent Element," by Tokailin, et al...

13/3,K/9 (Item 9 from file: 348)  
DIALOG(R) File 348:EUROPEAN PATENTS  
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00853461

White light-emitting electroluminescent devices  
Weiss-ausstrahlende organische Elektrolumineszenzvorrichtungen  
Dispositifs electroluminescents emettant de la lumiere blanche  
PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York  
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INVENTOR:

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Tang, Ching Wan, c/o Eastman Kodak Company, Patent Legal Staff, 343 State  
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LEGAL REPRESENTATIVE:

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PATENT (CC, No, Kind, Date): EP 786925 A2 970730 (Basic)  
EP 786925 A3 970924  
EP 786925 B1 020619

APPLICATION (CC, No, Date): EP 97200088 970113;

PRIORITY (CC, No, Date): US 592830 960126

DESIGNATED STATES: DE; FR; GB

INTERNATIONAL PATENT CLASS: H05B-033/14; C09K-011/06

ABSTRACT WORD COUNT: 68

NOTE:

Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	199707W5	269
CLAIMS B	(English)	200225	155
CLAIMS B	(German)	200225	153
CLAIMS B	(French)	200225	187
SPEC A	(English)	199707W5	4150
SPEC B	(English)	200225	3839
Total word count - document A			4420
Total word count - document B			4334
Total word count - documents A + B			8754

...SPECIFICATION a current conducting organic layer.

BACKGROUND OF THE INVENTION

The organic electroluminescent devices which emit white light from a current conducting organic layer have very important applications. The

applications of such a device include paper-thin light sources, a backlight for liquid crystal display, and full color displays achieved by combining the emitters with micropatterned color filters. The following patents and publications disclose the preparation of organic EL devices, capable of emitting white light, comprising a hole transporting layer and an organic luminescent layer, and interposed between a...

...electrodes.

Sato in JP 07,142,169 discloses an organic electroluminescent device, capable of emitting white light, is made by stacking a blue light emitting layer next to the hole transporting layer and followed by a green light emitting layer having a region containing a red fluorescent dye.

Kido et al., in Science, Vol. 267, p. 1332, (1995), also in Appl. Phys. Lett. Vol. 64, p. 815, (1994), report a white light-emitting organic electroluminescent device. In this device, three emitter layers with different carrier transport properties, each emitting blue, green, or red light, are used to generate white light.

Littman et al. in U.S. Patent No. 5,405,709 discloses another emitting

...

...SPECIFICATION a current conducting organic layer.

#### BACKGROUND OF THE INVENTION

The organic electroluminescent devices which emit white light from a current conducting organic layer have very important applications. The applications of such a device include paper-thin light sources, a backlight for liquid crystal display, and full color displays achieved by combining the emitters with micropatterned color filters. The following patents and publications disclose the preparation of organic EL devices, capable of emitting white light, comprising a hole transporting layer and an organic luminescent layer, and interposed between a...

...electrodes.

Sato in JP 07,142,169 discloses an organic electroluminescent device, capable of emitting white light, is made by stacking a blue light emitting layer next to the hole transporting layer and followed by a green light emitting layer having a region containing a red fluorescent dye.

Kido et al., in Science, Vol. 267, p. 1332, (1995), also in Appl. Phys. Lett. Vol. 64, p. 815, (1994), report a white light-emitting organic electroluminescent device. In this device, three emitter layers with different carrier transport properties, each emitting blue, green, or red light, are used to generate white light.

Littman et al. in U.S. Patent No. 5,405,709 discloses another emitting

...

...extended abstract, 8 - 13 October 1995, Chicago, USA, pages 1316-1317, XP002035633, "White and colored organic electroluminescent devices for backlights", report thin-film organic electroluminescent (EL) devices having, in a first approach, a thin layer of a blue-emitting species, 2-naphthyl-4,5-bis(4-methoxyphenyl)-1,3-oxazole (denoted NAPOXA), sandwiched...

...bis(triphenyl)diamine, hole transporter) and AlQ (tris(8-hydroxyquinoline)aluminum, electron transporter) to produce white-light emission. In one example of this first approach the organic dye DCM 1 was...

13/3,K/10 (Item 10 from file: 348)  
DIALOG(R) File 348:EUROPEAN PATENTS  
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00670077

White light emitting internal junction organic electroluminescent device.  
Weiss ausstrahlende organische Elektrolumineszenzvorrichtung mit innerem  
Zonenubergang.

Dispositif electroluminescent emettant de la lumiere blanche avec jonction  
interne.

PATENT ASSIGNEE:

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PATENT (CC, No, Kind, Date): EP 643549 A1 950315 (Basic)

APPLICATION (CC, No, Date): EP 94420238 940905;

PRIORITY (CC, No, Date): US 121712 930913

DESIGNATED STATES: DE; FR; GB

INTERNATIONAL PATENT CLASS: H05B-033/14; C09K-011/06;

ABSTRACT WORD COUNT: 186

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CLAIMS A	(English)	EPAB95	499
SPEC A	(English)	EPAB95	9529
Total word count - document A			10028
Total word count - document B			0
Total word count - documents A + B			10028

...SPECIFICATION the hole injecting and transporting zone.

ADVANTAGEOUS EFFECT OF THE INVENTION

The white light emitting organic electroluminescent device of the  
invention requires no patterning for its fabrication and can be  
advantageously employed with a readily available color filter array to  
produce full color flat panel displays.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic diagram of...devices of this invention.

It is possible to produce an organic electroluminescent device that  
emits white light by combining fluorescent materials that emit broad  
band red light and broad band blue light because both the red and  
blue light emitters also emit substantial amounts of green light.  
Thus, red and blue fluorescing materials can be combined in  
appropriate concentrations with a single host material in a single layer  
to produce emitted white light. Preferably, the red and blue light  
emitting materials are each included with a host material in two  
individual layers close...

...the hole transporting layer. In either the single layer or double layer  
format, the neutral color balance resulting in white light emission

is controlled by the relative concentrations of the red and blue light emitting materials; the concentrations of each required depend on several factors, including the relative...33 and  $Y = 0.34$ .

This result demonstrates the production of white light by an organic electroluminescent device comprising a combination of fluorescent materials that emit broad band red light and broad band blue light, in accordance with the present invention.

Other features of the invention are included below...

13/3,K/11 (Item 11 from file: 348)  
DIALOG(R)File 348:EUROPEAN PATENTS  
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00532353

Organic electroluminescent multicolor image display device  
Organische elektrolumineszierende Mehrfarbbildanzeigevorrichtung  
Dispositif d'affichage electroluminescent organique a image multicolore  
PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201214), 343 State Street, Rochester, New York  
14650-2201, (US), (applicant designated states: BE;DE;FR;GB;NL)

INVENTOR:

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Chang, Jack Che-Man, c/o EASTMAN KODAK COMPANY, Patent Legal Staff, 343  
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PATENT (CC, No, Kind, Date): EP 550063 A2 930707 (Basic)  
EP 550063 A3 940126  
EP 550063 B1 970212

APPLICATION (CC, No, Date): EP 92122113 921229;

PRIORITY (CC, No, Date): US 814553 911230

DESIGNATED STATES (Pub A): AT; BE; CH; DE; DK; ES; FR; GB; GR; IE; IT; LI;  
LU; MC; NL; PT; SE; (Pub B): BE; DE; FR; GB; NL

INTERNATIONAL PATENT CLASS: H05B-033/14; H05B-033/26; C09K-011/06;

ABSTRACT WORD COUNT: 175

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	EPAB97	1226
CLAIMS B	(German)	EPAB97	1340
CLAIMS B	(French)	EPAB97	1319
SPEC B	(English)	EPAB97	10756
Total word count - document A			0
Total word count - document B			14641
Total word count - documents A + B			14641

...SPECIFICATION electroluminescent image display devices of the invention are also more efficient than devices that emit white light and depend on a patterned color filter array for a multicolor imaging capability. Assuming an ideal system in which white light is emitted that is uniform in intensity throughout the visible spectrum and color filter sub-pixels are employed each of which transmit all light in one third of

...



...absorb all light received in the remainder of the visible spectrum (that is, an ideal **color** filter array), it is apparent that two thirds of the light emitted is internally absorbed and emission efficiency is necessarily limited to only one third that possible with the **color** filter array absent. In other words, superimposing a multicolor image display capability on a **white** emitter by the use of a **color** filter array reduces emission efficiency by two thirds in an ideal system. In actual implementation...light stimulates fluorescent emission in the green or red.

A very significant advantage of absorbing **blue** light emission from the organic EL medium and reemitting longer wavelength, **green** or **red**, light by fluorescence is that the efficiency of light emission can be very much superior to that achieved employing a **color** filter array in combination with a **white** light emitting **organic EL** medium. In the latter arrangement a theoretical maximum efficiency of only 33 percent is possible, since each sub-pixel of the **color** filter array absorbs and does not transmit two-thirds of the photons it receives. Further, aside from efficiency losses due to the **color** filter array, it is to be noted that the **organic EL** medium cannot be optimized to emit in any one portion of the visible spectrum, but...

...The efficiency of the present invention is controlled by (a) the efficiency of emission of **blue** light by the organic EL medium, (b) the efficiency with which the **blue** light is absorbed by the fluorescent media, and (c) the efficiency with which fluorescent media is stimulated to emit longer wavelength light. Considering (a) first, it is apparent that the **blue** emitting organic EL medium employed in the device 100 can be selected from a variety...

...highly efficient materials that would be highly inefficient in providing emission in each of the **blue**, **green** and **red** portions of the spectrum (that is, in providing **white** light emission). Turning to (b), high levels of efficiency can be realized in absorbing **blue** light emitted by the **organic EL** medium. There is no reason in theory why 100% of the **blue** light emitted can not be absorbed by the fluorescent medium. It is contemplated that in all instances at least 50% and preferably at least 80% of **blue** light emitted in the **green** and **red** sub-pixels can be absorbed. Turning to (c), a variety of fluorescent materials are known...

...in excess of 80% of light absorption are contemplated. Thus, within readily attainable levels of **blue** light absorption and longer wavelength fluorescence efficiencies, the **green** and **red** sub-pixels are capable of delivering to the viewer substantially greater than half the number of photons received from the **blue** emitting **organic EL** medium. For example, assuming an absorption efficiency of 80% and a fluorescence efficiency of 80%, both of which are readily attainable, 64% of the photons received from the **organic EL** medium are transmitted to the viewer in areas containing the fluorescent medium. In the **blue** sub-pixel areas, the efficiency is approximately 100%, since light absorption in the transparent electrode...

?

File 9:Business & Industry(R) Jul/1994-2003/Nov 18  
(c) 2003 Resp. DB Svcs.

File 15:ABI/Inform(R) 1971-2003/Nov 18  
(c) 2003 ProQuest Info&Learning

File 16:Gale Group PROMT(R) 1990-2003/Nov 18  
(c) 2003 The Gale Group

File 20:Dialog Global Reporter 1997-2003/Nov 19  
(c) 2003 The Dialog Corp.

File 47:Gale Group Magazine DB(TM) 1959-2003/Nov 18  
(c) 2003 The Gale group

File 75:TGG Management Contents(R) 86-2003/Nov W2  
(c) 2003 The Gale Group

File 80:TGG Aerospace/Def.Mkts(R) 1986-2003/Nov 18  
(c) 2003 The Gale Group

File 88:Gale Group Business A.R.T.S. 1976-2003/Nov 17  
(c) 2003 The Gale Group

File 98:General Sci Abs/Full-Text 1984-2003/Oct  
(c) 2003 The HW Wilson Co.

File 112:UBM Industry News 1998-2003/Nov 19  
(c) 2003 United Business Media

File 141:Readers Guide 1983-2003/Oct  
(c) 2003 The HW Wilson Co

File 148:Gale Group Trade & Industry DB 1976-2003/Nov 19  
(c)2003 The Gale Group

File 160:Gale Group PROMT(R) 1972-1989  
(c) 1999 The Gale Group

File 275:Gale Group Computer DB(TM) 1983-2003/Nov 18  
(c) 2003 The Gale Group

File 264:DIALOG Defense Newsletters 1989-2003/Nov 18  
(c) 2003 The Dialog Corp.

File 369:New Scientist 1994-2003/Nov W2  
(c) 2003 Reed Business Information Ltd.

File 484:Periodical Abs Plustext 1986-2003/Nov W2  
(c) 2003 ProQuest

File 553:Wilson Bus. Abs. FullText 1982-2003/Oct  
(c) 2003 The HW Wilson Co

File 570:Gale Group MARS(R) 1984-2003/Nov 19  
(c) 2003 The Gale Group

File 608:KR/T Bus.News. 1992-2003/Nov 19  
(c)2003 Knight Ridder/Tribune Bus News

File 620:EIU:Viewswire 2003/Nov 18  
(c) 2003 Economist Intelligence Unit

File 613:PR Newswire 1999-2003/Nov 19  
(c) 2003 PR Newswire Association Inc

File 621:Gale Group New Prod.Annou. (R) 1985-2003/Nov 19  
(c) 2003 The Gale Group

File 623:Business Week 1985-2003/Nov 18  
(c) 2003 The McGraw-Hill Companies Inc

File 624:McGraw-Hill Publications 1985-2003/Nov 18  
(c) 2003 McGraw-Hill Co. Inc

File 634:San Jose Mercury Jun 1985-2003/Nov 18  
(c) 2003 San Jose Mercury News

File 635:Business Dateline(R) 1985-2003/Nov 18  
(c) 2003 ProQuest Info&Learning

File 636:Gale Group Newsletter DB(TM) 1987-2003/Nov 18  
(c) 2003 The Gale Group

File 647:CMP Computer Fulltext 1988-2003/Nov W3  
(c) 2003 CMP Media, LLC

File 674:Computer News Fulltext 1989-2003/Nov W2  
(c) 2003 IDG Communications

File 810:Business Wire 1986-1999/Feb 28

(c) 1999 Business Wire  
File 813:PR Newswire 1987-1999/Apr 30  
(c) 1999 PR Newswire Association Inc

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Set	Items	Description
S1	7286	OLED OR ORGANIC(W) (LED OR LIGHT()EMIT?() (DEVICE? ? OR DIOD- E? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL)
S2	35379	WHITE(5N) (BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LO- WER OR MORE OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING) (3N) (POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTE- RY?)) (5N) (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR ...
S3	28	S1(15N)S2
S4	13	RD S3 (unique items)
S5	7	S4 NOT PY>2001
S6	0	AU=(SIWINSKI, M? OR SIWINSKI M?)
S7	3048	WHITE(7N)COMPAR?(7N) (COLOR OR COLOUR OR RED OR GREEN OR BL- UE OR RED()BLUE()GREEN OR RGB)
S8	0	S1(15N)S7
S9	2097	S1(15N) (WHITE(10N)BETTER OR EFFICIEN? OR EFFECTIVE OR HIGH- ER OR LOWER OR MORE OR LESS OR GREATER OR LESSER OR (SAVE OR - SAVES OR SAVING) (3N) (POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?) (10N) (COLOR OR COLOUR OR RED OR GREEN OR ...
S10	1249	S9 NOT (S5 OR PY>2001)
S11	527	RD S10 (unique items)
S12	4	S11(15N) (WHITE(10N) (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RED()BLUE()GREEN OR RGB))

5/3,K/1 (Item 1 from file: 16)  
DIALOG(R) File 16:Gale Group PROMT(R)  
(c) 2003 The Gale Group. All rts. reserv.

08646045 Supplier Number: 74797908 (USE FORMAT 7 FOR FULLTEXT)  
**SID tech sessions to address materials, processes, early apps --**  
**Researchers plant seeds for organic LED growth. (Industry Trend or Event)**  
Lieberman, David  
Electronic Engineering Times, p65  
May 21, 2001  
Language: English Record Type: Fulltext  
Document Type: Magazine/Journal; Trade  
Word Count: 1692

... CCM), builds on work previously reported by Idemitsu and Eastman Kodak. It colorizes a monochrome ( **blue** ) **OLED** by placing fluorescent materials above each pixel in **red** , **blue** and **green** triads or stripes.  
"This approach allows **better** performance than **white** displays with **color** filters on top because no light is lost through filter absorption," the team will report...

5/3,K/2 (Item 2 from file: 16)  
DIALOG(R) File 16:Gale Group PROMT(R)  
(c) 2003 The Gale Group. All rts. reserv.

07290762 Supplier Number: 61848569 (USE FORMAT 7 FOR FULLTEXT)  
**Covion and eMagin Team to Develop and Commercialize OLED Display Materials.**  
Business Wire, p1174  
May 2, 2000  
Language: English Record Type: Fulltext  
Document Type: Newswire; Trade  
Word Count: 900

... drive schemes, and systems integration. eMagin was the world's first company to demonstrate an **OLED** -on-Silicon video display and has demonstrated the world's most **efficient** full- **color** spectrum **white** OLEDs. eMagin's work with Covion will supplement its current efforts with Eastman Kodak and...

5/3,K/3 (Item 3 from file: 16)  
DIALOG(R) File 16:Gale Group PROMT(R)  
(c) 2003 The Gale Group. All rts. reserv.

06456105 Supplier Number: 55090390 (USE FORMAT 7 FOR FULLTEXT)  
**Microdisplays' Performance, High-Resolution Draw Industry Attention At SID '99.**  
Ajluni, Cheryl  
Electronic Design, v47, n13, p29  
June 28, 1999  
Language: English Record Type: Fulltext Abstract  
Document Type: Magazine/Journal; Trade  
Word Count: 607

... host of new technological developments which represent major milestones in the effort to develop full- **color** , high-resolution, power-**efficient** microdisplays.  
One such announcement--a high- **efficiency** **white** -emitting **organic**

light - emitting diode ( OLED ) - comes from FED Corp., Hopewell Junction, N.Y. The company's new device purportedly is...

5/3,K/4 (Item 4 from file: 16)  
DIALOG(R) File 16:Gale Group PROMT(R)  
(c) 2003 The Gale Group. All rts. reserv.

06224992 Supplier Number: 54234137 (USE FORMAT 7 FOR FULLTEXT)  
Display conference to detail advances for plastic light emitters -- Organic LEDs ramped for low-cost displays. (Company Business and Marketing)  
Lieberman, David  
Electronic Engineering Times, p59(1)  
March 29, 1999  
Language: English Record Type: Fulltext  
Document Type: Magazine/Journal; Trade  
Word Count: 1125

... Tohoku Pioneer Electric Corp. (Yamagata, Japan) will report on Pioneer's development of a passive OLED : a full- color , 5.2-inch, 1/4-VGA display delivering a white peak luminance of more than 150 nits with a power dissipation of 6 W.

At SID, the OLED will also strut its stuff in several presentations by American, Japanese and Chinese academics with...

5/3,K/5 (Item 1 from file: 20)  
DIALOG(R) File 20:Dialog Global Reporter  
(c) 2003 The Dialog Corp. All rts. reserv.

05362595 (USE FORMAT 7 OR 9 FOR FULLTEXT)  
REMINDER/Planar Systems to Exhibit High Performance Display Technology at Society for Information Display Annual Event  
BUSINESS WIRE  
May 18, 1999  
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT  
WORD COUNT: 584

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... annual event. The presentations will cover advancements in Planar's miniature AMEL displays and improved white phosphors for better color in TFEL displays. In addition, Planar has participated in research on the emerging OLED technology that will be presented during the Symposium.  
WHERE: Society for Information Display  
1999 International...

5/3,K/6 (Item 2 from file: 20)  
DIALOG(R) File 20:Dialog Global Reporter  
(c) 2003 The Dialog Corp. All rts. reserv.

05155466 (USE FORMAT 7 OR 9 FOR FULLTEXT)  
ADVISORY/Planar Systems to Exhibit High Performance Display Technology at Society for Information Display Annual Event  
BUSINESS WIRE  
April 30, 1999  
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT  
WORD COUNT: 556

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... annual event. The presentations will cover advancements in Planar's miniature AMEL displays and improved **white** phosphors for **better color** in TFEL displays. In addition, Planar has participated in research on the emerging **OLED** technology that will be presented during the Symposium. WHERE: Society for Information Display 1999 International...

5/3,K/7 (Item 1 from file: 647)  
DIALOG(R)File 647:CMP Computer Fulltext  
(c) 2003 CMP Media, LLC. All rts. reserv.

01236957 CMP ACCESSION NUMBER: EET20010521S0050  
**SID tech sessions to address materials, processes, early apps -**  
**Researchers plant seeds for organic LED growth**  
David Lieberman  
ELECTRONIC ENGINEERING TIMES, 2001, n 1167, PG65  
PUBLICATION DATE: 010521  
JOURNAL CODE: EET LANGUAGE: English  
RECORD TYPE: Fulltext  
SECTION HEADING: TECHNOLOGY  
WORD COUNT: 1563

... CCM), builds on work previously reported by Idemitsu and Eastman Kodak. It colorizes a monochrome ( **blue** ) **OLED** by placing fluorescent materials above each pixel in **red** , **blue** and **green** triads or stripes.

"This approach allows **better** performance than **white** displays with **color** filters on top because no light is lost through filter absorption," the team will report...  
?

12/3,K/1 (Item 1 from file: 9)  
DIALOG(R)File 9:Business & Industry(R)  
(c) 2003 Resp. DB Svcs. All rts. reserv.

3322122 Supplier Number: 03322122 (USE FORMAT 7 OR 9 FOR FULLTEXT)  
OLED/CMOS combo opens a new world of microdisplay: lightweight organic  
light-emitting diodes are being combined with CMOS silicon technology to  
enable small displays on head-worn and hand-held devices. (Microdisplays)  
(New generation of microdisplays features combination of organic  
light-emitting diode technology and complementary metal oxide  
semiconductor silicon technology)  
Laser Focus World, v 37, n 12, p 55(3)  
December 2001  
DOCUMENT TYPE: Journal ISSN: 1043-8092 (United States)  
LANGUAGE: English RECORD TYPE: Fulltext  
WORD COUNT: 1453

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:  
...a different but similar structure and materials to create large arrays  
of top-emitting full- color -spectrum white -light diodes.

(FIGURE 2 OMITTED)

In an OLED microdisplay, a stack of thin solid organic films totaling  
less than 1 gm is applied...

12/3,K/2 (Item 1 from file: 16)  
DIALOG(R)File 16:Gale Group PROMT(R)  
(c) 2003 The Gale Group. All rts. reserv.

09314098 Supplier Number: 81139793 (USE FORMAT 7 FOR FULLTEXT)  
OLED/CMOS combo opens a new world of microdisplay: lightweight organic  
light-emitting diodes are being combined with CMOS silicon technology to  
enable small displays on head-worn and hand-held devices.  
(Microdisplays).  
Jones, Susan K.; Howard, Webster E.  
Laser Focus World, v37, n12, p55(3)  
Dec, 2001  
Language: English Record Type: Fulltext  
Document Type: Magazine/Journal; Trade  
Word Count: 1634

... a different but similar structure and materials to create large  
arrays of top-emitting full- color -spectrum white -light diodes.

(FIGURE 2 OMITTED)

In an OLED microdisplay, a stack of thin solid organic films  
totaling less than 1 gm is applied...

12/3,K/3 (Item 1 from file: 20)  
DIALOG(R)File 20:Dialog Global Reporter  
(c) 2003 The Dialog Corp. All rts. reserv.

10810333 (USE FORMAT 7 OR 9 FOR FULLTEXT)  
Covion and eMagin Team to Develop and Commercialize OLED Display Materials  
BUSINESS WIRE  
May 02, 2000  
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT

WORD COUNT: 921

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... drive schemes, and systems integration. eMagin was the world's first company to demonstrate an OLED -on-Silicon video display and has demonstrated the world's most efficient full-color spectrum white OLEDs. eMagin's work with Covion will supplement its current efforts with Eastman Kodak and...

12/3,K/4 (Item 1 from file: 148)  
DIALOG(R)File 148:Gale Group Trade & Industry DB  
(c)2003 The Gale Group. All rts. reserv.

10907717 SUPPLIER NUMBER: 54234137 (USE FORMAT 7 OR 9 FOR FULL TEXT)  
Display conference to detail advances for plastic light emitters -- Organic LEDs ramped for low-cost displays.(Company Business and Marketing)  
Lieberman, David  
Electronic Engineering Times, 59(1)  
March 29, 1999  
ISSN: 0192-1541 LANGUAGE: English RECORD TYPE: Fulltext  
WORD COUNT: 1235 LINE COUNT: 00101

... Corp. (Yamagata, Japan) will report on Pioneer's development of a passive OLED: a full-color, 5.2-inch, 1/4-VGA display delivering a white peak luminance of more than 150 nits with a power dissipation of 6 W.  
At SID, the OLED will..



File 344:Chinese Patents Abs Aug 1985-2003/Apr  
(c) 2003 European Patent Office  
File 347:JAPIO Oct 1976-2003/Jul(Updated 031105)  
(c) 2003 JPO & JAPIO  
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200374  
(c) 2003 Thomson Derwent

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Set	Items	Description
S1	11125	OLED OR ORGANIC(W) (LED OR LIGHT()EMIT?() (DEVICE? ? OR DIOD- E? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL)
S2	126971	WHITE
S3	5219350	BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LOWER OR MORE OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING) (3N- ) (POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?)
S4	637395	(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RED()GREEN()BL- UE OR RGB)
S5	86	S1 AND S2 AND S3 AND S4
S6	5	S1 AND S2 (5W) S3 (5W) S4
S7	5	IDPAT (sorted in duplicate/non-duplicate order)
S8	5	IDPAT (primary/non-duplicate records only)
S9	14	S1 AND S2 (5N) S3 (5N) S4 NOT S8
S10	14	IDPAT (sorted in duplicate/non-duplicate order)
S11	13	IDPAT (primary/non-duplicate records only)
S12	1	S5 AND IC=(G09G-003/32 OR G09G-005/00) NOT (S8 OR S11)

8/3,K/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

015446411 \*\*Image available\*\*  
WPI Acc No: 2003-508553/200348  
XRAM Acc No: C03-136317  
XRPX Acc No: N03-403795

Organic electroluminescence elements for e.g. display devices, back lights, electrophotography, sign boards, have aromatic hydrocarbon or heterocyclic compounds and amine derivatives in light emitting layers  
Patent Assignee: FUJI PHOTO FILM CO LTD (FUJF )  
Number of Countries: 001 Number of Patents: 001  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 2003022893	A	20030124	JP 2001206636	A	20010706	200348 B

Priority Applications (No Type Date): JP 2001206636 A 20010706  
Patent Details:  
Patent No Kind Lan Pg Main IPC Filing Notes  
JP 2003022893 A 49 H05B-033/14

Organic electroluminescence elements for e.g. display devices, back lights, electrophotography, sign boards, have aromatic hydrocarbon or...

Abstract (Basic):

... The element emits white or blue lights with higher purity, having improved durability...

8/3,K/2 (Item 2 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

015400730 \*\*Image available\*\*  
WPI Acc No: 2003-462870/200344  
XRAM Acc No: C03-123670  
XRPX Acc No: N03-368390

Organic electroluminescent light-emitting element for light source of display device has organic light-emitting layer containing substituted pyridinyl imidazole, provided between electrodes  
Patent Assignee: MATAKA S (MATA-I); MATSUSHITA DENKI SANGYO KK (MATU ); SOEDA Y (SOED-I); TISU T M (TISU-I)  
Number of Countries: 001 Number of Patents: 001  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 2003133072	A	20030509	JP 2001327275	A	20011025	200344 B

Priority Applications (No Type Date): JP 2001327275 A 20011025  
Patent Details:  
Patent No Kind Lan Pg Main IPC Filing Notes  
JP 2003133072 A 20 H05B-033/14

Organic electroluminescent light-emitting element for light source of display device has organic light-emitting layer containing...

Abstract (Basic):

... The organic electroluminescent light-emitting element has an organic light-emitting layer (4) which has light-emission area...  
... The organic electroluminescent light-emitting element has an

organic light-emitting layer (4) which has light-emission area...

...The light-emitting element emits **white** and **blue** luminescence **efficiently** and the continuous actuation stability is improved, hence the brightness emission for long period of...

...The figure shows the principal sectional drawing of the **organic electroluminescent** light-emitting element...

Extension Abstract:

... 0.5 nm/second in the vacuum to film thickness of 200 nm and an **organic electroluminescent** light-emitting element was obtained. The light-emitting element had excellent initial-stage brightness and...

8/3,K/3 (Item 3 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

012250089 \*\*Image available\*\*  
WPI Acc No: 1999-056196/199905  
XRAM Acc No: C99-016935  
XRPX Acc No: N99-042715

Organic electroluminescent device - comprise a hole transporting layer, based on (aza)benzothioxanthene, and electron transporting layer between an anode and a cathode which are formed on a substrate

Patent Assignee: MITSUBISHI CHEM CORP (MITU )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 10308278	A	19981117	JP 97118107	A	19970508	199905 B

Priority Applications (No Type Date): JP 97118107 A 19970508

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 10308278	A	18	H05B-033/14	

Organic electroluminescent device...

...Abstract (Basic): The **organic EL** device comprises a hole transporting layer and an electron transporting layer interposed between an anode...

...USE - The **organic EL** device is used in thin film type devices emitting white colour light...

...ADVANTAGE - **White colour** luminescence device, having improvedly **higher colour** purity and stable luminescence spectrum, can be obtained...

8/3,K/4 (Item 4 from file: 347)  
DIALOG(R)File 347:JAPIO  
(c) 2003 JPO & JAPIO. All rts. reserv.

05144673 \*\*Image available\*\*  
WHITE FLUORESCENCE CONVERSION FILM AND WHITE LIGHT EMITTING ELEMENT CONTAINING THE FILM

PUB. NO.: 08-100173 [JP 8100173 A]  
PUBLISHED: April 16, 1996 (19960416)

INVENTOR(s): IKEDA HIDEJI  
TSUCHIYA JUN  
APPLICANT(s): IDEMITSU KOSAN CO LTD [330172] (A Japanese Company or  
Corporation), JP (Japan)  
APPL. NO.: 06-237558 [JP 94237558]  
FILED: September 30, 1994 (19940930)

ABSTRACT

... the subject conversion film capable of converting the emission color of a blue light-emitting **organic EL** element into **white color** in high **efficiency**, producible at a low cost, enabling the reduction of the size and the thickness of...

8/3,K/5 (Item 5 from file: 347)  
DIALOG(R) File 347:JAPIO  
(c) 2003 JPO & JAPIO. All rts. reserv.

04797660 \*\*Image available\*\*  
**ORGANIC ELECTROLUMINESCENCE ELEMENT**

PUB. NO.: 07-090260 [JP 7090260 A]  
PUBLISHED: April 04, 1995 (19950404)  
INVENTOR(s): KIDO JUNJI  
APPLICANT(s): SUMITOMO ELECTRIC IND LTD [000213] (A Japanese Company or  
Corporation), JP (Japan)  
APPL. NO.: 06-112502 [JP 94112502]  
FILED: May 26, 1994 (19940526)

**ORGANIC ELECTROLUMINESCENCE ELEMENT**

ABSTRACT

... molecularly dispersed pigment, capable of emitting blue color light, three primary color multicolor light or **white color** light, excellent in luminous **efficiency**, luminous brightness and stability, and useful for illumination, display, etc...

11/3,K/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

015585866 \*\*Image available\*\*  
WPI Acc No: 2003-648021/200362  
XRAM Acc No: C03-177451  
XRPX Acc No: N03-515599

Stacked organic electroluminescent device for use in lamp for area lighting, has anode, cathode, organic electroluminescent units between anode and cathode, and doped organic connector between each adjacent organic electroluminescent unit

Patent Assignee: EASTMAN KODAK CO (EAST )

Inventor: LIAO L L; TANG C W

Number of Countries: 032 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 1339112	A2	20030827	EP 200375309	A	20030203	200362 B
US 20030170491	A1	20030911	US 200277270	A	20020215	200367

Priority Applications (No Type Date): US 200277270 A 20020215

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

EP 1339112 A2 E 32 H01L-051/20

Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR

US 20030170491 A1 H05B-033/00

Stacked organic electroluminescent device for use in lamp for area lighting, has anode, cathode, organic electroluminescent units between anode and cathode, and doped organic connector between each adjacent organic electroluminescent unit

Abstract (Basic):

... A stacked organic electroluminescent (EL) device comprises anode (210), cathode (240), organic EL units (220.1 - 220.N) between anode and cathode, and doped organic connector (230.1=230.(N-1)) disposed between each adjacent organic EL unit.  
... a) a lamp for area lighting comprising: transparent substrate; and stacked organic electroluminescent device emitting white light; and...

...b) a full-color matrix display observable by viewer comprising: matrix array of stacked organic EL devices; mechanism die independently electrically activating each device; and array of red, green, and blue

...The device enables stacked organic light emitting diode (OLED) (200) to function without requiring intraelectrodes to lower optical losses, and provides significantly improved luminance...

...output, can be operated with single voltage source, provides new way to adjust the emission color, and produces high efficiency white electroluminescence...

...The figure depicts a schematic cross sectional view of a stacked OLED having stacked organic EL units and doped organic connector in between each of the organic EL units...

... Organic light emitting diode (200...

... Organic EL units (220.1 - 220.N  
Technology Focus:

... Preferred Component: The organic EL units comprise small  
molecule materials, hole-transporting layer and electron-transporting  
layer, polymeric materials; and...

11/3,K/2 (Item 2 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

015055596 \*\*Image available\*\*  
WPI Acc No: 2003-116112/200311  
XRAM Acc No: C03-030054  
XRPX Acc No: N03-092585

Organic electroluminescent device simultaneously exhibits blue light  
emission and orange light emission on same light emitting in-plane and  
achieves white light emission which has superior color purity  
Patent Assignee: FUJII PHOTO FILM CO LTD (FUJIF ); TOYOTA CHUO KENKYUSHO KK  
(TOYW )

Number of Countries: 001 Number of Patents: 001  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 2002329578	A	20021115	JP 2001133598	A	20010427	200311 B

Priority Applications (No Type Date): JP 2001133598 A 20010427

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 2002329578	A	20	H05B-033/14	

Organic electroluminescent device simultaneously exhibits blue light  
emission and orange light emission on same light emitting in...

Abstract (Basic):

... Containing the fluorescent pigment in the compound of formula  
(I) yields a blue organic electroluminescent device having high  
efficiency and prolonged life. A combination of the compound of formula  
(I...

...emission and orange light emission on the same light emitting in-plane.  
The result achieves white light emission having superior color  
purity to yield with high efficiency a white light emitting device  
having high durability...

11/3,K/3 (Item 3 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

013497075 \*\*Image available\*\*  
WPI Acc No: 2000-669016/200065  
XRPX Acc No: N00-496043

Organic electroluminescent light emitting device for use as back  
light of non-spontaneous light display device, emits different white  
light by combining red, blue and green colors emitted by EL light  
emission areas

Patent Assignee: CASIO COMPUTER CO LTD (CASK )  
Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
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JP 2000277257 A 20001006 JP 9978319 A 19990323 200065 B

Priority Applications (No Type Date): JP 9978319 A 19990323

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes  
JP 2000277257 A 25 H05B-033/12

Organic electroluminescent light emitting device for use as back light of non-spontaneous light display device, emits...

Abstract (Basic):

... Stripe shaped organic EL light emission areas (5r,5g,5b) emitting red, green and blue colors are provided on...  
... An INDEPENDENT CLAIM is also included for organic EL display device...

...as back light of non-spontaneous light display device such as liquid crystal display device, organic EL display device...

...As white light is emitted by combining red, blue and green colors, efficiency is improved and high intensity light is emitted with low power consumption...

...The figure shows the explanatory drawing of organic EL light emitting device...

11/3,K/4 (Item 4 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

013038141 \*\*Image available\*\*  
WPI Acc No: 2000-209993/200019  
XRAM Acc No: C00-065347  
XRPX Acc No: N00-156797

Organic electroluminescence elements giving higher lighting performance in blue to white color - comprises bisbenzazole compounds

Patent Assignee: FUJI PHOTO FILM CO LTD (FUJF )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 11283746	A	19991015	JP 9881606	A	19980327	200019 B

Priority Applications (No Type Date): JP 9881606 A 19980327

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes  
JP 11283746 A 10 H05B-033/14

Organic electroluminescence elements giving higher lighting performance in blue to white color -

...Abstract (Basic): ADVANTAGE - The EL element provides a higher lighting performance, especially, in blue to white colour.

11/3,K/5 (Item 5 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
(c) 2003 Thomson Derwent. All rts. reserv.

011700094

WPI Acc No: 1998-117004/199811

XRAM Acc No: C98-038570

XRPX Acc No: N98-093916

**Organic electroluminescent device - comprising luminescent picture elements made of base electrode and counter electrode arranged on substrate**

Patent Assignee: IDEMITSU KOSAN CO LTD (IDEK )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 10003990	A	19980106	JP 96174286	A	19960613	199811 B

Priority Applications (No Type Date): JP 96174286 A 19960613

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 10003990	A	35	H05B-033/14	

**Organic electroluminescent device...**

...Abstract (Basic): The **organic EL** device comprises a number of luminescence picture elements, formed by multilayering the base electrode, the...

...USE - The **organic EL** device is used as the white colour EL device...

...ADVANTAGE - The **organic EL** device, with which **white** colour luminescence in high brightness and high **efficiency** is possible, can be obtd...

11/3,K/6 (Item 6 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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010445749

WPI Acc No: 1995-347066/199545

XRPX Acc No: N95-259434

**Organic electroluminescent device - distributes colouring matter in macromolecular form and light emitting layer has white light emitting layer**

Patent Assignee: SHINGIJUTSU JIGYODAN (SHKJ )

Number of Countries: 000 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 7220871	A	19950818	JP 948785	A	19940128	199545 B

Priority Applications (No Type Date): JP 948785 A 19940128

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 7220871	A	7	H05B-033/14	

**Organic electroluminescent device...**

...Abstract (Basic): ADVANTAGE - Provides **white** light emitting layer with high intensity. Provides **effective** , full **colour** device...

11/3,K/7 (Item 7 from file: 350)

DIALOG(R)File 350:Derwent WPIX



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010065447

WPI Acc No: 1994-333159/199441

Related WPI Acc No: 2001-244022

XRAM Acc No: C94-151594

XPX Acc No: N94-261428

Organic electroluminescent element used as emitter of the  
luminescence - has 1,2,4-triazole deriv layer, carrier transport control  
layer, and electron transport layer

Patent Assignee: SUMITOMO ELECTRIC IND CO (SUME )

Inventor: KIDO J

Number of Countries: 019 Number of Patents: 013

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9422974	A1	19941013	WO 94JP435	A	19940317	199441 B
JP 7003257	A	19950106	JP 93147849	A	19930618	199511
JP 7041759	A	19950210	JP 93186223	A	19930728	199516
EP 647694	A1	19950412	EP 94910036	A	19940317	199519
			WO 94JP435	A	19940317	
JP 7090260	A	19950404	JP 94112502	A	19940526	199522
EP 647694	A4	19950726	EP 94910036	A		199617
JP 2734338	B2	19980330	JP 93147849	A	19930618	199818
JP 2734341	B2	19980330	JP 93186223	A	19930728	199818
US 5869199	A	19990209	WO 94JP435	A	19940317	199913
			US 95343494	A	19950111	
SG 59953	A1	19990222	SG 964373	A	19940317	199931
JP 2937015	B2	19990823	JP 94112502	A	19940526	199939
EP 647694	B1	19990915	EP 94910036	A	19940317	199942
			WO 94JP435	A	19940317	
DE 69420656	E	19991021	DE 620656	A	19940317	199950
			EP 94910036	A	19940317	
			WO 94JP435	A	19940317	

Priority Applications (No Type Date): JP 93186224 A 19930728; JP 9368783 A  
19930326; JP 93122927 A 19930525; JP 93147849 A 19930618; JP 93186223 A  
19930728

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 9422974 A1 J 62 C09K-011/06

Designated States (National): US

Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL  
PT SE

JP 7003257 A 6 C09K-011/06

JP 7041759 A 12 C09K-011/06

EP 647694 A1 E 45 C09K-011/06 Based on patent WO 9422974

Designated States (Regional): DE FR GB

JP 7090260 A 19 C09K-011/06

EP 647694 A4 C09K-011/06

JP 2734338 B2 6 C09K-011/06 Previous Publ. patent JP 7003257

JP 2734341 B2 12 C09K-011/06 Previous Publ. patent JP 7041759

US 5869199 A H05B-033/12 Based on patent WO 9422974

SG 59953 A1 H05B-033/12

JP 2937015 B2 22 H05B-033/22 Previous Publ. patent JP 7090260

EP 647694 B1 E C09K-011/06 Based on patent WO 9422974

Designated States (Regional): DE FR GB

DE 69420656 E C09K-011/06 Based on patent EP 647694

Based on patent WO 9422974

Organic electroluminescent element used as emitter of the  
luminescence...

...Abstract (Basic): An **organic electroluminescent** element comprises a 1,2,4-triazole deriv. layer...

...3-(4-bisphenyl)-4-phenyl-5-(4-tert-butylphenyl) 1,2,4-triazole (TAZ). The **organic electroluminescent** element comprises a poly-N-vinylcarbazole (PVK) layer as a hole-transport luminescent layer and...

...USE/ADVANTAGE - The element is useful as an emitter of **blue** luminescence, primary multi- **colour** luminescence and **white** luminescence. The element has an excellent luminous **efficiency**, luminance and stability...

11/3,K/8 (Item 8 from file: 347)  
DIALOG(R)File 347:JAPIO  
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07592536 \*\*Image available\*\*  
**ORGANIC LIGHT - EMITTING DIODE DEVICE**

PUB. NO.: 2003-086380 [JP 2003086380 A]  
PUBLISHED: March 20, 2003 (20030320)  
INVENTOR(s): HATWAR TUKARAM KISAN  
APPLICANT(s): EASTMAN KODAK CO  
APPL. NO.: 2002-234508 [JP 20022234508]  
FILED: August 12, 2002 (20020812)  
PRIORITY: 01 930050 [US 2001930050], US (United States of America),  
August 15, 2001 (20010815)

**ORGANIC LIGHT - EMITTING DIODE DEVICE**

ABSTRACT

PROBLEM TO BE SOLVED: To provide a highly **efficient**, **white** color emitting **organic light - emitting diode** device.

SOLUTION: The **organic light - emitting diode** device comprises (a) a substrate, (b) an anode arranged on top of the substrate, (c...

11/3,K/9 (Item 9 from file: 347)  
DIALOG(R)File 347:JAPIO  
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07348478 \*\*Image available\*\*  
**ORGANIC ELECTRIC FIELD LIGHT-EMITTING ELEMENT**

PUB. NO.: 2002-216969 [JP 2002216969 A]  
PUBLISHED: August 02, 2002 (20020802)  
INVENTOR(s): ISHII MASAHIKO  
NODA KOJI  
MIURA ATSUSHI  
OWAKI TAKESHI  
TAGA YASUNORI  
TANAKA HIROMITSU  
APPLICANT(s): TOYOTA CENTRAL RES & DEV LAB INC  
APPL. NO.: 2001-008284 [JP 20011008284]  
FILED: January 16, 2001 (20010116)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a superior white light emitting **organic EL** element.

SOLUTION: This has at least an organic light-emitting layer and an electron transport...

... to this blue. Because the electron transport layer exerts a high positive hole block function, **blue** light-emitting **efficiency** increases, and **blue** color purity can be improved, and a superior **white** light emission is obtained. If a single layer of the blue color light-emitting layer and the electron transport layer are combined, a blue light-emitting **organic EL** element of a high color purity can be realized.

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11/3,K/10 (Item 10 from file: 347)

DIALOG(R)File 347:JAPIO

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07295691 \*\*Image available\*\*

WHITE COLOR **ORGANIC ELECTROLUMINESCENCE** PANEL

PUB. NO.: 2002-164170 [JP 2002164170 A]

PUBLISHED: June 07, 2002 (20020607)

INVENTOR(s): KISHIGAMI YASUHISA

KIDO JUNJI

KONDO YUKIHIRO

TSUBAKI KENJI

APPLICANT(s): MATSUSHITA ELECTRIC WORKS LTD

KIDO JUNJI

APPL. NO.: 2000-360219 [JP 2000360219]

FILED: November 27, 2000 (20001127)

WHITE COLOR **ORGANIC ELECTROLUMINESCENCE** PANEL

ABSTRACT

PROBLEM TO BE SOLVED: To provide a **white color organic electroluminescence** panel that has high **efficiency** and a long life.

SOLUTION: This concerns a **white color** electroluminescence panel that is formed by holding an organic light-emitting material 3 between a...

11/3,K/11 (Item 11 from file: 347)

DIALOG(R)File 347:JAPIO

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06025178 \*\*Image available\*\*

**ORGANIC ELECTROLUMINESCENT** ELEMENT

PUB. NO.: 10-308278 [JP 10308278 A]

PUBLISHED: November 17, 1998 (19981117)

INVENTOR(s): SATO YOSHIHARU

OGATA TOMOYUKI

MURATA YUKICHI

APPLICANT(s): MITSUBISHI CHEM CORP [000596] (A Japanese Company or Corporation), JP (Japan)

APPL. NO.: 09-118107 [JP 97118107]

FILED: May 08, 1997 (19970508)

**ORGANIC ELECTROLUMINESCENT ELEMENT**

**ABSTRACT**

PROBLEM TO BE SOLVED: To stably emit the light of **white color** with excellent **color** pureness and high light emitting **efficiency** by forming an element of a positive hole transporting layer, which includes a benzothioxanthene derivative...

11/3,K/12 (Item 12 from file: 347)  
DIALOG(R)File 347:JAPIO  
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05999394 \*\*Image available\*\*  
LIQUID CRYSTAL DISPLAY DEVICE

PUB. NO.: 10-282494 [JP 10282494 A]  
PUBLISHED: October 23, 1998 (19981023)  
INVENTOR(s): KANEKO NORIHIKO  
SHIRASAKI TOMOYUKI  
APPLICANT(s): CASIO COMPUT CO LTD [350750] (A Japanese Company or Corporation), JP (Japan)  
APPL. NO.: 09-102425 [JP 97102425]  
FILED: April 07, 1997 (19970407)

**ABSTRACT**

PROBLEM TO BE SOLVED: To provide a liquid crystal display device provided with an **organic EL** surface light emitting panel capable of obtaining **white** light having high intrasurface uniformity and executing highly **efficient** light emission and having **color** display performance...

...SOLUTION: An **organic EL** element 15 for executing blue surface light emission is formed on the back of a...

11/3,K/13 (Item 13 from file: 347)  
DIALOG(R)File 347:JAPIO  
(c) 2003 JPO & JAPIO. All rts. reserv.

03384990 \*\*Image available\*\*  
**ORGANIC ELECTROLUMINESCENCE ELEMENT**

PUB. NO.: 03-047890 [JP 3047890 A]  
PUBLISHED: February 28, 1991 (19910228)  
INVENTOR(s): HOSOKAWA CHISHIO  
KUSUMOTO TADASHI  
AZUMA HISAHIRO  
APPLICANT(s): IDEMITSU KOSAN CO LTD [330172] (A Japanese Company or Corporation), JP (Japan)  
APPL. NO.: 02-067249 [JP 9067249]  
FILED: March 19, 1990 (19900319)  
JOURNAL: Section: C, Section No. 831, Vol. 15, No. 189, Pg. 142, May 15, 1991 (19910515)

**ORGANIC ELECTROLUMINESCENCE ELEMENT**

**ABSTRACT**

PURPOSE: To obtain the title element capable of obtaining **blue** luminescence having high brightness in high **efficiency** and also

obtaining **white** luminescence and suitable as luminescent element for various display devices by using a compound having...  
?

12/3,K/1 (Item 1 from file: 350)  
DIALOG(R)File 350:Derwent WPIX  
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015267764 \*\*Image available\*\*  
WPI Acc No: 2003-328693/200331  
XRPX Acc No: N03-262872

Color organic electroluminescent display power saving method  
for personal computer, involves converting color digital image into  
monochrome image which is displayed using white light emitting elements  
of display

Patent Assignee: EASTMAN KODAK CO (EAST )  
Inventor: SIWINSKI M J  
Number of Countries: 001 Number of Patents: 001  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020186214	A1	20021212	US 2001874128	A	20010605	200331 B

Priority Applications (No Type Date): US 2001874128 A 20010605

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20020186214	A1		6 G09G-005/00	

Color organic electroluminescent display power saving method  
for personal computer, involves converting color digital image into  
monochrome image which is displayed using white light emitting elements  
of display

Abstract (Basic):

... A portion of a color digital image is converted into a  
monochrome image which is displayed by using the white light emitting  
elements in the display (30).

... An INDEPENDENT CLAIM is included for color organic  
electroluminescent display...

...For saving power in color organic electroluminescent flat  
panel display (claimed) such as organic light emitting diodes  
(OLEDs) used in personal computer, personal digital assistant, laptop  
computer, cellular telephone, etc...

...Since the white light elements are used to display the monochrome  
image, the power consumption is efficiently reduced in the display...

Title Terms: COLOUR ;

International Patent Class (Main): G09G-005/00

?

*this is my case*